

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Gregory G. Raleigh, et al.
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Title: DEVICE-ASSISTED SERVICES FOR PROTECTING NETWORK
CAPACITY

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PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES
PATENT NO. 10,237,773 PURSUANT TO 35 U.S.C. §§ 311–319,
37 C.F.R. § 42

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EXHIBITS

- SAMSUNG-1001 U.S. Patent No. 10,237,773 to Raleigh, et al. (“the ’773 Patent”)
- SAMSUNG-1002 Excerpts from the Prosecution History of the ’773 Patent (“the Prosecution History”)
- SAMSUNG-1003 Declaration and Curriculum Vitae of Dr. Patrick Traynor
- SAMSUNG-1004 Complaint, *Headwater Research LLC v. Samsung Electronics Co., Ltd. et al.*, 2:22-cv-00467, E.D. Tex., December 6, 2022
- SAMSUNG-1005 U.S. Patent Publication No. 2008/0080458 A1 (“Cole”)
- SAMSUNG-1006 U.S. Patent Publication No. 2009/0119773 A1 (“D’Amore”)
- SAMSUNG-1007 U.S. Patent Publication No. 2006/0039354 A1 (“Rao”)
- SAMSUNG-1008 U.S. Patent No. 5,987,611 (“Freund”)
- SAMSUNG-1009 U.S. Patent Publication No. 2005/0037740 A1 (“Smith”)
- SAMSUNG-1010 European Patent Publication No. 1 484 871 A1 (“Kelz”)
- SAMSUNG-1011 U.S. Patent No. US 2008/0057894 A1 (“Aleksic”)
- SAMSUNG-1012 U.S. Patent No. 7,924,730 B1 (“McAllister”)
- SAMSUNG-1013 Excerpts from the Prosecution History of U.S. Patent No. 9,277,445 to Raleigh, et al. (“the Prosecution History of the ’445 Patent”)
- SAMSUNG-1014 U.S. Patent No. 6,947,723 B1 (“Gurnani”)
- SAMSUNG-1015 Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Director’s Guidance”)
- SAMSUNG-1016 Samsung Stipulation letter regarding IPR grounds in District court litigation

SAMSUNG-1017 Amended Docket Control Order, *Headwater Research LLC v. Samsung Electronics Co., Ltd. et al.*, 2:22-cv-00422, E.D. Tex., April 21, 2023

SAMSUNG-1018 U.S. Patent Publication No. 2010/0115048 A1 (“Scahill”)

SAMSUNG-1019 U.S. Patent No. 8,713,667 B2 (“Kalibjian”)

LISTING OF CHALLENGED CLAIMS

Claim 1	
[1pre]	A wireless end-user device, comprising:
[1.1]	a processor:
[1.2]	a Wireless Wide-Area Network (WWAN) modem, to communicate data for network service usage activities between the wireless end-user device and a WWAN; and
[1.3]	a non-transitory computer-readable storage medium storing instructions that, when provided to the processor, cause the processor to
[1.4]	receive respective requests from a plurality of applications on the device to access the WWAN for background network service usage activities associated with the respective applications,
[1.5]	based at least in part on a current WWAN network busy state, select a corresponding current service usage control policy for the background network service usage activities,
[1.6]	determine respective deferred time slots for each of the background network service usage activities based on the current service usage control policy, wherein at least one such service usage control policy specifies that during a time when the current WWAN network busy

	state indicates network congestion, a selected subset of the background network service usage activities are deferred until network congestion is no longer indicated, and
[1.7]	allow each of the background network service usage activities to access the WWAN during the respective deferred time slot for that background network service usage activity.
Claim 2	
[2]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to classify the respective requests with respective priorities, and the at least one such service usage control policy determines the selected subset of the background network service usage activities based on the respective priorities of the respective requests.
Claim 3	
[3]	The wireless end-user device of claim 2, wherein to classify the respective requests with respective priorities comprises maintaining a network capacity-controlled services list indicating one or more ap-

	plications having a network capacity control, and assigning a respective priority to a request based on the network capacity-controlled services list.
Claim 4	
[4]	The wireless end-user device of claim 3, wherein the network capacity-controlled services list is based at least in part on user preference selections.
Claim 5	
[5]	The wireless end-user device of claim 1, wherein to allow each of the background network service usage activities to access the WWAN during the respective deferred time slot comprises blocking or delaying execution of the application associated with a given background network service usage activity until the respective deferred time slot is reached.
Claim 6	
[6]	The wireless end-user device of claim 1, wherein to allow each of the background network service usage activities to access the WWAN

	during the respective deferred time slot comprises informing an application associated with a given background network service activity when the WWAN is available for that activity.
Claim 7	
[7]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to, based on at least one selected current service usage policy, defer at least one of the background network service usage activities until a different network, other than the WWAN, is available to communicate data for that at least one of the background network service usage activities.
Claim 8	
[8]	The wireless end-user device of claim 7, wherein the different network comprises a specific network selection for that at least one of the background network service usage activities.
Claim 9	
[9]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to select different service usage control policies based at least in part on, in addition

	to the current WWAN network busy state, monitoring of user interaction with the device.
Claim 10	
[10]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to select different service usage control policies based at least in part on, in addition to the current WWAN network busy state, a power state.
Claim 11	
[11]	The wireless end-user device of claim 1, wherein to receive respective requests from a plurality of applications comprises receiving the requests through an operating system device service access Application Programming Interface (API), the API allowing applications to request a time slot demand for a background network service usage activity.
Claim 12	
[12]	The wireless end-user device of claim 1, wherein to receive respective requests from a plurality of applications comprises receiving the

	requests through an operating system device service access Application Programming Interface (API), the API allowing applications to indicate a data size for a background network service usage activity.
Claim 13	
[13]	The wireless end-user device of claim 1, wherein the current network busy state is received from a network element via the WWAN.
Claim 14	
[14]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to generate the current network busy state.
Claim 15	
[15]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to select the corresponding current service usage control policy for the background network service usage activities based on a service plan active on the device, in addition to the current WWAN network busy

	state, the service plan including network busy state-based criteria restrictions that apply to network capacity-controlled services, including one or more of the background network service usage activities.
Claim 16	
[16]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to apply the current service usage control policy for one or more of the background network service activities based on a service usage behavior analysis of the activity.
Claim 17	
[17]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to apply the current service usage control policy for one or more of the background network service activities based on monitoring power consumption behavior of the activity.
Claim 18	
[18]	The wireless end-user device of claim 1, wherein the instructions provided to the processor further cause the processor to apply the

	current service usage control policy for one or more of the background network service activities based on monitoring user interaction with the activity.
Claim 19	
[19]	The wireless end-user device of claim 1, the one or more processors further configured to communicate with one or more of the applications through an Application Programming Interface that informs each such application of one or more policies applied to background network service usage activities associated with that application.
Claim 20	
[20]	The wireless end-user device of claim 1, wherein to determine respective deferred time slots for each of the background network service usage activities further comprises delaying a time slot for a particular one of the background network service usage activities at least until a first time delay has occurred since a previous deferred time slot associated with that activity.

Samsung Electronics Co., Ltd. (“**Petitioner**” or “**Samsung**”) petitions for *Inter Partes* Review (“**IPR**”) of claims 1-20 (“**the Challenged Claims**”) of U.S. Patent No. 10,237,773 (“**the ’773 Patent**”). Compelling evidence presented in this Petition demonstrates at least a reasonable likelihood that Samsung will prevail with respect to at least one of the Challenged Claims.

I. REQUIREMENTS FOR IPR

A. Grounds for Standing

Petitioner certifies that the ’773 Patent is available for IPR. This petition is being filed within one year of service of a complaint against Petitioner. SAM-SUNG-1004. Petitioner is not barred or estopped from requesting review of the Challenged Claims on the below-identified grounds.

B. Challenge and Relief Requested

Petitioner requests an IPR of the Challenged Claims on the grounds noted below. Dr. Patrick Traynor provides supporting testimony in his Declaration. SAMSUNG-1003, ¶¶[1]-[139].

Ground	Claim(s)	35 U.S.C. § 103
1A	1, 5-8, 10, 13-14, and 20	Cole
1B	1-8, 10, 13-15, and 20	Cole in view of D’Amore
1C	9, 11-12, 16, and 18-19	Cole in view of Rao
1D	9, 11-12, 16, and 18-19	Cole in view of D’Amore and Rao

Ground	Claim(s)	35 U.S.C. § 103
1E	17	Cole in view of Aleksic
1F	17	Cole in view of D'Amore and Aleksic

The '773 Patent claims priority to a number of provisional applications, the earliest of which was filed January 28, 2009. SAMSUNG-1001, Cover. While Petitioner does not concede that January 28, 2009 is the priority date that should be afforded to the '773 Patent, for the purposes of this proceeding, each of the references asserted in this Petition qualifies as prior art under 35 USC §§102(a), (b), or (c) (as shown in the table below) even if the January 28, 2009 date (also referred to as "Critical Date") of the provisional application is used as the priority date of the '773 Patent.

Reference	Filing Date	Publication Date
Cole	Sep. 29, 2006	Apr. 3, 2008
D'Amore	May 27, 2008	May 7, 2009
Rao	Jul. 22, 2005	Feb. 23, 2006
Aleksic	Aug. 31, 2006	Mar. 6, 2008

C. Claim Construction

Petitioner submits that no formal claim constructions are necessary because “claim terms need only be construed to the extent necessary to resolve the controversy.” *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011); SAMSUNG-1003, ¶[24]. Petitioner reserves the right to respond to any constructions offered by Patent Owner or adopted by the Board. Petitioner is not conceding that each challenged claim satisfies all statutory requirements, nor is Petitioner waiving any arguments concerning claim scope or grounds that can only be raised in district court. For this petition, Petitioner applies prior art in a manner consistent with Patent Owner’s allegations of infringement before the district court.

D. Level of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) relating to the subject matter of the ’773 Patent as of January 28, 2009 would have had (1) at least a bachelor’s degree in computer science, electrical engineering, or a related field, and (2) at least two years of industry experience in services and application implementation in communication networks. SAMSUNG-1003, ¶¶[22]-[23]. Additional graduate education could substitute for professional experience, and *vice versa*. *Id.*

II. THE '773 PATENT

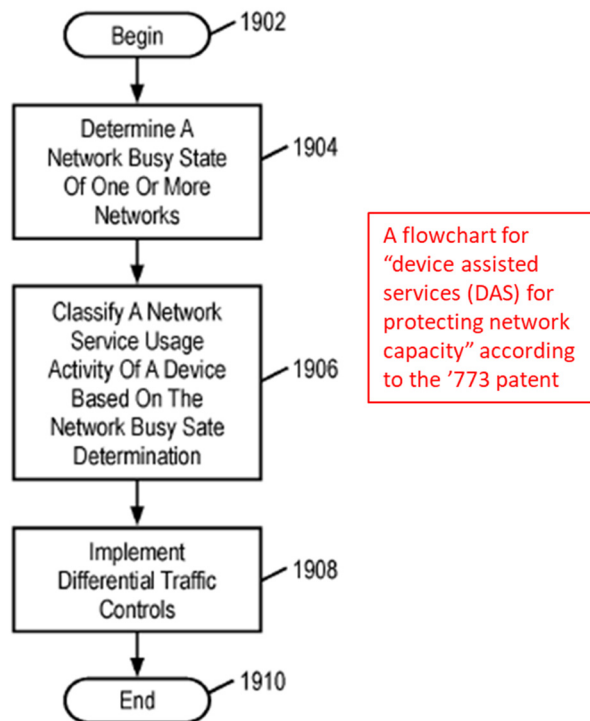
A. Brief Description

The '773 Patent is directed to “a Device Assisted Services (DAS) for protecting network capacity.” SAMSUNG-1001, Abstract. The '773 Patent describes an example process of implementing “DAS” that includes “classifying a network service usage activity (e.g., a network capacity controlled service) of a device based on [a] network busy state determination.” SAMSUNG-1001, 72:34-45; SAMSUNG-1003, ¶[25].

The '773 Patent explains that the network busy state is “based on one or more of the following: network performance, network congestion, network availability, network resource availability, network capacity, or **any other network service usage measure**, and one or more time windows (e.g., time based criteria).” *Id.*, 72:45-50. Busy state can also be determined based on “a time of day, **a network reported busy state**, and/or **a device** (e.g., near-end and/or far-end) **determined/reported network busy state**” and “a network probe, a device query, a network probe report ..., a network probe analysis, a device analysis based on performance of native traffic without probe such as TCP timeout, UDP retransmissions, a multiple network test, a device monitored network congestion based on network service usage activity ... performed for a network to which the device is connected and/or one or more alternative networks.” *Id.*, 73:1-14; SAMSUNG-1003, ¶[26].

The '773 Patent also describes that the “network busy state” can be associated with a “network congestion state.” *Id.*; 73:14-20; SAMSUNG-1003, ¶[26].

An example process for implementing DAS according to the '773 Patent is provided below in FIG. 19. SAMSUNG-1001; 72:34-67, 73:1-20. As illustrated below in step 1906, the process includes “classifying a network service usage activity ... to facilitate differential network access control for protecting network capacity.” SAMSUNG-1001, 72:40-44. The process continues in step 1908 by “implementing differential traffic controls.” SAMSUNG-1001, 72:64-66. The '773 Patent provides examples of “differential network service usage control” (referred interchangeably as “differential traffic controls”) that include “delay[ing]” and “time window[ing]” network service usage activities. SAMSUNG-1001, 13:22-42; SAMSUNG-1003, ¶[27].



SAMSUNG-1001, FIG. 19.¹

B. Prosecution History

The '773 Patent was allowed after one Office Action during a Track 1 prioritized examination that included only a rejection under 35 U.S.C. §101 and a double patenting rejection. SAMSUNG-1002, 83-96. In response to this Office Action, Paten Owner made minor claim amendments and filed a terminal disclaimer. *Id.*, 42-50. Allowance was then received. *Id.*, 7-11. During prosecution, the Examiner did not consider any of Cole, D'Amore, Aleksic, and Rao. These references render the Challenged Claims obvious, as discussed below. SAMSUNG-1003, ¶[28].

¹ Annotations to the figures throughout this Petition are shown in color.

III. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. [GROUNDS 1A AND 1B] – Claims 1, 5-8, 10, 13-14, and 20 are rendered obvious by Cole [1A] and Claims 1-8, 10, 13-15, and 20 are rendered obvious by Cole and D’Amore [1B]

Below, the Petition presents a first ground ([1A]) based on Cole alone and a second ground ([1B]) based on the combination of Cole and D’Amore. In ground [1A], the Petition explains why Cole renders obvious claims 1, 5-8, 10, 13-14, and 20. In ground [1B], the Petition relies on the same disclosure of Cole as relied upon in the first ground [1A], and turns to D’Amore’s disclosure as rendering obvious the “selected subset” feature of claim 1 (*“a selected subset of the background network service usage activities”*) as additional support to Cole’s disclosure of this feature. Because the use of Cole’s disclosure and corresponding obviousness arguments are similar for both grounds [1A/1B], the Petition discusses these grounds together for ease of presentation. SAMSUNG-1003, ¶[29].

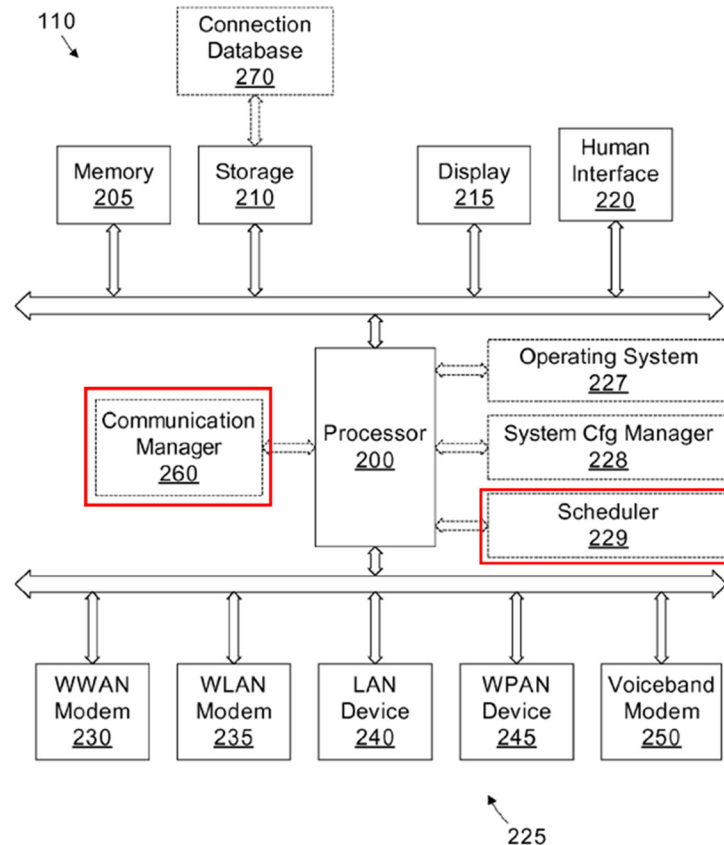
1. Overview of Cole²

Cole describes “[a] method for configuring a mobile device including a plurality of communication interfaces” including a “first communication interface”

² Descriptions of the references and combinations thereof are incorporated into each mapping that includes citations to these references. Emphasis is added to text using bold and/or italicized font unless otherwise indicated.

and multiple “second ... communication interfaces” that are “selected for establishing a second connection to a remote network.” SAMSUNG-1005, Abstract, ¶[0014]. Cole uses a “connection manager 260”³ to select “communication interfaces” for connecting to remote networks (e.g., a wireless local area network (WLAN), a wireless wide area network (WWAN), and a wireless personal area network (WPAN)). SAMSUNG-1005, ¶¶[0015], [0003], [0031], [0035], [0036], FIGS. 1, 2. The connection manager can also “schedule various events” to “effectively use available bandwidth.” *Id.*, ¶¶[0036], [0074], [0118], [0119]. This includes taking action when “monitored loads” exceed a “predetermined threshold.” *Id.*, ¶[0075], [0077]; SAMSUNG-1003, ¶[30].

³ Cole also refers to the “connection manager 260” as the “communication manager 260.” SAMSUNG-1005, ¶[0088], FIG. 2.



SAMSUNG-1005, FIG. 2.

Cole's "connection manger" manages communication interfaces to "determine which connections should be active at any given time." SAMSUNG-1005, ¶[0036]. This determination includes monitoring various network connectivity metrics, such as battery power, connection bandwidth, communication capabilities, connection availability, user preferences, application requirements, and mobile device resources. SAMSUNG-1005, ¶¶[0036], [0080]. For instance, in some cases, the connection manager may establish a connection with a communication interface based on application requirements. SAMSUNG-1005, ¶[0069]. To assist in

evaluating communication interfaces, the connection manager “maintains data related to each of the communication interfaces,” to include “connection name, connection technology type, a location (LOC), a configuration flag (CFG), a bandwidth (BW), a connection time (CT), a user interaction required (UI) flag, a fast connect availability flag (FC), a power characteristics (PC), thermal characteristics (TC), a vendor name, a technical support contact (TSC) information, an ignore flag,” and more. SAMSUNG-1005, ¶[0037]. Cole describes that these parameters may be “based on historical data ... user specified parameters, or static parameters,” and may also be “monitored” by the connection manager. SAMSUNG-1005, ¶[0038]; SAMSUNG-1003, ¶[31].

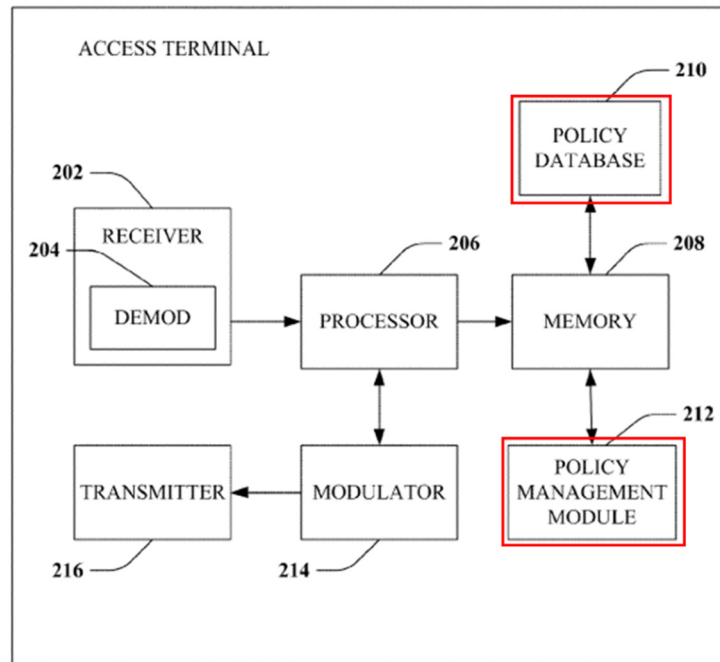
Cole describes that, when “the monitored load exceeds a predetermined threshold (e.g., 85% of capacity), the connection manager 260 may take one of several actions to manage the load.” SAMSUNG-1005, ¶[0075]. For example, Cole describes that applications can be “aborted,” “postpone[d],” cancelled and re-scheduled, and “block[ed].” SAMSUNG-1005, ¶[0080], ¶¶[0085]-[0090], ¶[0125]. Cole additionally describes that these above actions can be taken in response to mobile device states, including a “power state.” SAMSUNG-1005, ¶¶[0090]-[0098]. “By monitoring the load on an active connection, the connection manager 260 tries to proactively prevent increased latency from an overloaded

connection from impacting the performance of the running applications or the efficiency of the user.” SAMSUNG-1005, ¶[0075]; SAMSUNG-1003, ¶[32].

2. Overview of D’Amore

D’Amore describes “management and arbitration of dedicated mobile communication resources for mobile applications.” SAMSUNG-1006, Abstract. This management is accomplished through a “priority level that establishes an importance with respect to one or more other mobile applications and at least one mobile resource.” SAMSUNG-1006, Abstract. D’Amore explains that, “[if] competing applications attempt to access the mobile resource concurrently, access can be provided to an application having higher priority level” and that “control of a resource can be taken away from an application having lower priority in order to affect control of such resource for a higher priority application.” SAMSUNG-1006, Abstract; SAMSUNG-1003, ¶[33].

D’Amore’s FIG. 2 (reproduced below) depicts an example of an access terminal, which is also referred to as a “mobile station, mobile, mobile device, [or] cellular device.” SAMSUNG-1006, ¶¶[0049], [0019]. D’Amore’s access terminal includes a policy database 210 and a policy management module 212 (outlined in red in D’Amore’s FIG. 2 below). SAMSUNG-1006, ¶[0050]; SAMSUNG-1003, ¶[34].



SAMSUNG-1006, FIG. 2.

D’Amore’s policy database 210 “associates a privilege code or a priority level, or both, with at least one mobile application.” SAMSUNG-1006, ¶[0050]. This priority level “establishes a relative order of importance for the mobile application with respect to other mobile applications” for “managing and prioritizing access to network/device resources.” SAMSUNG-1006, ¶[0050]; SAMSUNG-1003, ¶[35].

D’Amore’s policy management module 212 can “approve or deny access to a mobile device resource and/or mobile network resource for a mobile application” “based at least in part on a priority level or a privilege code associated with the mobile application.” SAMSUNG-1006, ¶[0050]. The policy management module 212 also includes “a configuration module” that allows “customization of privilege

code or priority level information for one or more mobile applications” by a

“user.” SAMSUNG-1006, ¶[0063]; SAMSUNG-1003, ¶[36].

3. Combination of Cole and D’Amore

It would have been obvious to a POSITA to combine the teachings of Cole and D’Amore such that D’Amore’s policies (e.g., policies stored in policy database 210, policy management module 212) would have been incorporated into the decision making of Cole’s connection manager. SAMSUNG-1003, ¶[37]; *see supra* §III.A.1, §III.A.2. As Dr. Traynor explains, a POSITA would have combined Cole and D’Amore to further improve the management of applications in devices such as Cole’s mobile device. SAMSUNG-1003, ¶[37]. For instance:

- 1) The increased ability to manage application priority and mobile device resources provided by D’Amore would have enabled Cole’s mobile device to host additional and more complex applications without fear of conflict. SAMSUNG-1006, ¶[0003]-[0004]; SAMSUNG-1003, ¶[39].
- 2) D’Amore’s “privilege codes” would have been used in the Cole mobile device to prevent unauthorized resource access, increasing user privacy protection and offering increased control of sensitive mobile device information and resources. SAMSUNG-1006, ¶¶[0006], [0049]-[0051]; SAMSUNG-1003, ¶[38].
- 3) The ability of D’Amore’s “service provider” to initially set priority levels

for applications would enable greater provider control of mobile device resources across many such mobile devices, while simultaneously reducing requirements for user interaction to specify priorities for each one of many applications executing on their mobile device. SAMSUNG-1006, ¶¶[0050]-[0051], [0070]; SAMSUNG-1003, ¶[39].

- 4) D’Amore’s application level “priority policies” would add additional granularity to the decisions of Cole’s connection manager, such that the connection manager has a more accurate understanding of the activity/application priority when making deferral or rescheduling decisions. SAMSUNG-1005, ¶¶[0074]-[0097]; SAMSUNG-1006, ¶¶[0050], [0051]; SAMSUNG-1003, ¶[38].
- 5) Incorporating D’Amore’s application level priorities would also allow conflict-resolution in the event Cole’s connection manager was faced with conflicting priorities, for example, determining which application should be afforded a rescheduled time slot during a time of limited connectivity. SAMSUNG-1005, ¶¶[0118]-[0127]; SAMSUNG-1006, ¶¶[0050], [0051]; SAMSUNG-1003, ¶[39].

As explained below in more detail, combining Cole and D’Amore would have been obvious at least because such a combination would have merely in-

volved (1) combining prior art elements according to known methods to yield predictable results; and the (2) use of known techniques to improve similar devices in the same way. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007); *MPEP 2143*; SAMSUNG-1003, ¶[40]. Indeed, Cole already describes utilizing certain policies to control the execution of applications and the combination of D'Amore's teachings would simply involve adding D'Amore's known policies to Cole's similar system, thus, for at least this reason, making the Cole-D'Amore combination predictable and foreseeable with a reasonable expectation of success. SAMSUNG-1005, ¶[0074]-[0075]; SAMSUNG-1003, ¶[40]. Moreover, because Cole's connection manager "proactively prevent[s] increased latency from an overloaded connection from impacting the performance of the running applications," a similar design objective to D'Amore, the use of D'Amore's policies in Cole would have improved a similar device in the same way. SAMSUNG-1005, ¶[0074]; SAMSUNG-1006, ¶[0032] ("systematically multiplex and distribute mobile device and/or network resources"); SAMSUNG-1003, ¶[40].

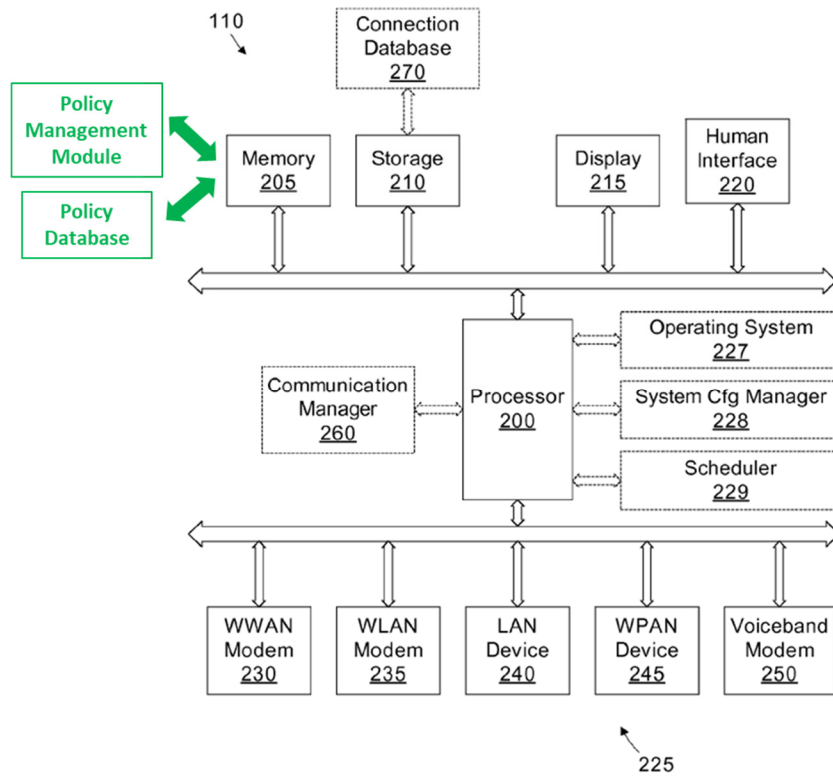
Incorporating D'Amore's policies (e.g. policy database 210, policy management module 212), and policies therein) into Cole's connection manager would also have been predictable and foreseeable with a reasonable expectation of success because D'Amore's policies describe similar actions as those taken by Cole's

connection manager in response to undesirable application activities. SAMSUNG-1005, ¶¶[0074]-[0097]; SAMSUNG-1006, ¶¶[0060]-[0061]. For example, D'Amore describes an "access termination module" that can "remove access to a system resource." SAMSUNG-1006, ¶[0060]. Similarly, Cole's connection manager "determines if one or more actions that are consuming bandwidth should be postponed." SAMSUNG-1005, ¶[0085], *see also* ¶¶[0074]-[0097]. As Dr. Traynor explains, a POSITA would have recognized or found obvious that the postponement of an action by Cole's connection manager would also have involved removing access to device resources for an application, like in D'Amore. SAMSUNG-1003, ¶[41]. Additionally, both Cole and D'Amore implement their techniques in end-user devices ("mobile devices"). SAMSUNG-1005, ¶¶[0014]-[0015], SAMSUNG-1006, [0007]-[0016]; SAMSUNG-1003, ¶[41]. Finally, the incorporation of D'Amore's policies would have simply involved the implementation of software in a system already designed to execute similar program modules. SAMSUNG-1005, ¶¶[0033]-[0036], [0074]; SAMSUNG-1006, ¶¶[0032], [0049]. As Dr. Traynor explains, "the decision to implement D'Amore's policies in Cole would have been an obvious design choice as a POSITA would have naturally experimented with known policies within the capability of Cole's processing capability, such as those described in D'Amore." SAMSUNG-1003, ¶[41].

In an example of the combined Cole-D'Amore system, illustrated below in

Cole's Figure 2, D'Amore's policies (e.g., policies stored in policy database 210, policy management module 212) would have been incorporated into Cole's memory 205, storage 210, and/or connection database 270, such that they could be referenced by the communication manager 260 when making deferral and rescheduling decisions. SAMSUNG-1005, ¶¶[0034]-[0036], [0074]-[0097], FIG. 2; SAMSUNG-1006, ¶¶[0049]-[0060], FIG. 2; SAMSUNG-1003, ¶[42]. In the combined system, application activities would have been assigned a priority level or code based on their associated application (e.g., "classified"), as taught by D'Amore, and Cole's connection manager 260 would operate leverage this additional granularity when determining which application activities should be deferred. SAMSUNG-1005, ¶¶[0034]-[0036], [0074]-[0097], FIG. 2; SAMSUNG-1006, ¶¶[0049]-[0060], FIG. 2; SAMSUNG-1003, ¶[42]. Moreover, Cole's scheduler evaluates many device states and parameters when scheduling application tasks. SAMSUNG-1005, ¶¶[0119]-[0126]. Therefore, D'Amore's priority policies would assist Cole's connection manager 260 in directing the scheduler to effectively schedule application tasks and improve the ability of the mobile device to use available network bandwidth (e.g., by reducing the number of high-priority tasks that are spuriously rescheduled, thus forcing the user to override the scheduler and execute the task). SAMSUNG-1005, ¶¶[0119]-[0126]; SAMSUNG-1006, ¶¶[0059]-[0061]. In doing so, the Cole-D'Amore device would have improved

network utilization efficiency by preferentially scheduling higher priority application activities during times of network availability (one of the main objectives of Cole). SAMSUNG-1005, ¶¶[0006]-[0011], ¶¶[0074]-[0075]; SAMSUNG-1003, ¶[42].



SAMSUNG-1006, FIG. 2 (modified based on D'Amore).

4. Analysis

[1.pre]

To the extent the preamble is limiting, each of Cole and the Cole-D'Amore

combination render [1.pre] obvious⁴. For example, Cole’s communication system 100 includes “a mobile device 110 interfacing with a plurality of communication networks 120, such as a wireless wide area network (WWAN).” SAMSUNG-1005, ¶[0031], FIGS. 1, 2. An example of the Cole-D’Amore communication system is shown below. SAMSUNG-1003, ¶[43].

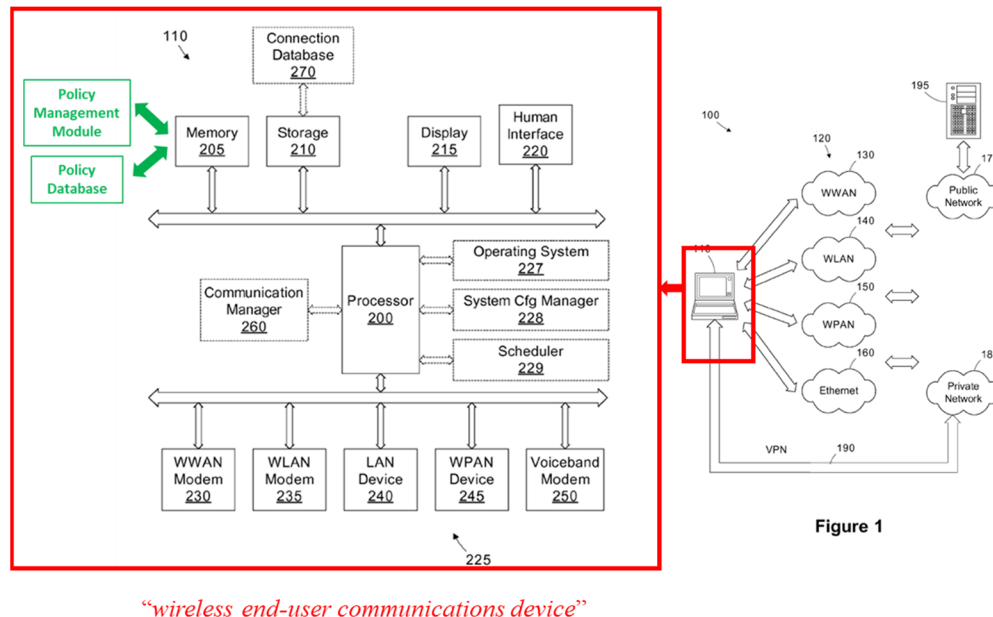


Figure 1

SAMSUNG-1005, FIG. 2 (left, modified based on D’Amore), FIG. 1 (right).

The “mobile device 110 may be ... a notebook computer, ... a personal data assistant (PDA), a mobile telephone, etc.” SAMSUNG-1005, ¶[0034]. Cole’s example implementations of the mobile device 110 are consistent with the examples

⁴ Unless otherwise noted, the remarks and mappings of Cole under Ground 1A also apply to the Cole-D’Amore combination (Ground 1B).

of end-user devices described in the '773 Patent, which include “smart phone devices, net book devices, tablet computing devices, and various other **wireless mobile computing devices**.” SAMSUNG-1001, 3:29-44; SAMSUNG-1003, ¶[44].

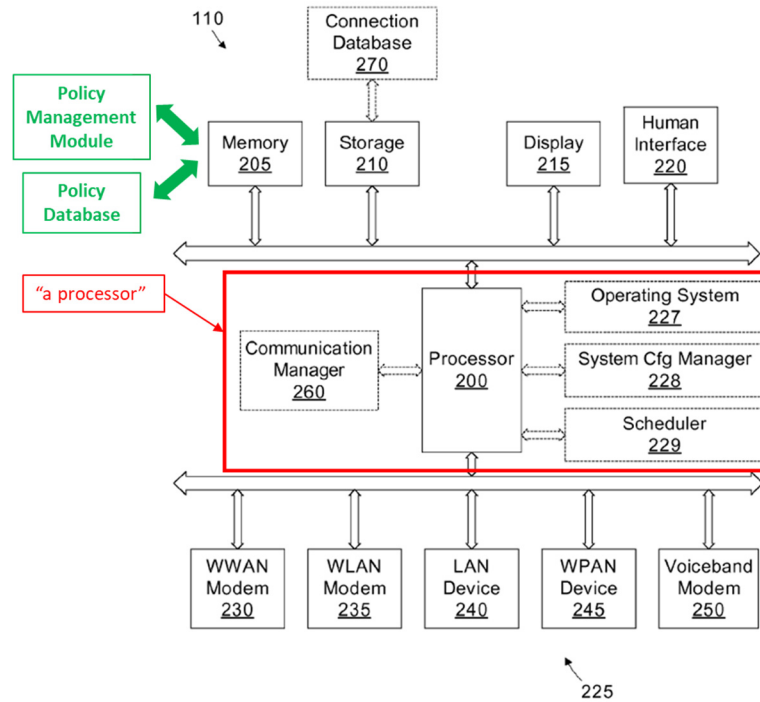
As Dr. Traynor explains, it would have been known or obvious to a POSITA that Cole’s mobile device 110 is a “wireless end-user communication device” because Cole’s mobile device 110 can wirelessly communicate with other devices and can be used by an end-user. SAMSUNG-1003, ¶[45]. Indeed, Smith, a US patent application, corroborates this understanding and explains that an “end-user device,” can be “**a wireless telephone station**, a wired telephone station, a **personal digital assistant**, and a laptop computer.” SAMSUNG-1009, [0007]; SAMSUNG-1003, ¶[45], [47]-[48].

As explained in more detail below, Cole or Cole-D’Amore also render obvious the various features of the wireless end-user communications device claimed in the '773 Patent. SAMSUNG-1003, ¶[46].

[1.1]

As shown in Cole’s FIG. 2 below, Cole’s mobile device 110 includes a “processor.” SAMSUNG-1005, ¶¶[0015], [0034]-[0036], FIG. 2. Cole’s “processor is coupled to the communication interfaces and operable to implement a connection manager.” SAMSUNG-1005, ¶[0015]; SAMSUNG-1003, ¶[49]. Additionally,

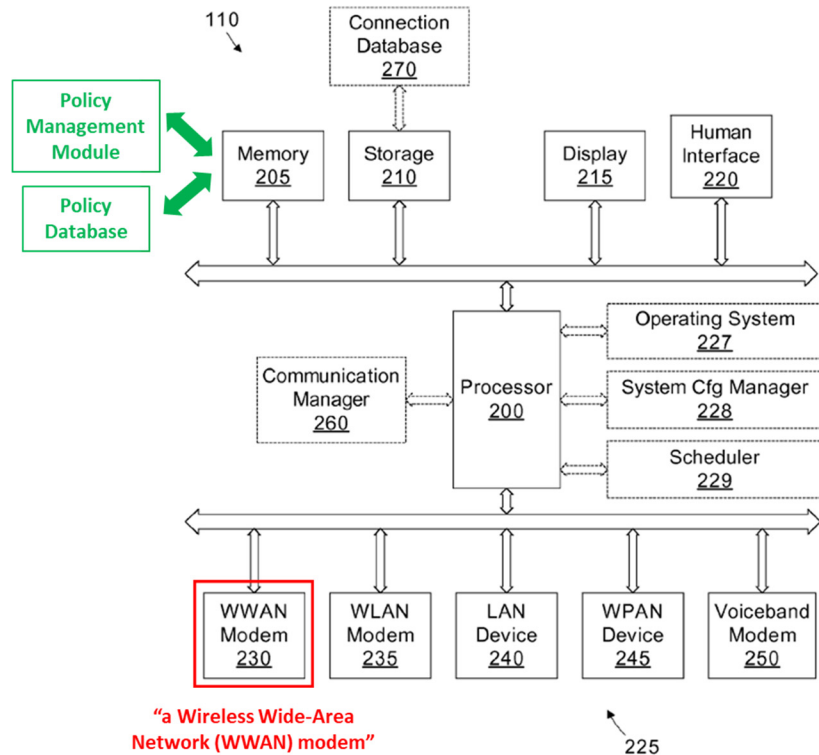
Cole describes that the processor executes “various software applications,” to include “user applications, an operating system 227, a system connection manager 228, a scheduler 229, device drivers, etc.” SAMSUNG-1005, ¶[0034]. Cole also describes its connection manager 260 as a “software application.” SAMSUNG-1005, ¶[0036]; SAMSUNG-1003, ¶[49]. Consistent with this explanation, Dr. Traynor has provided an annotated version of Cole’s FIG. 2 (shown below) in which the red box labelled “a processor” includes several components whose operations are implemented by the processor. SAMSUNG-1003, ¶[49]. Thus, the red box represents, at least in part, a functional equivalent of the processor because the processor executes the operations that are described with respect to these components. SAMSUNG-1003, ¶[49]. The red box would be the same in the Cole and Cole-D’Amore systems.



SAMSUNG-1005, FIG. 2 (modified based on D'Amore).

[1.2]

As shown in Cole's FIG. 2 below, Cole's mobile device 110 includes a "WWAN modem" ("a Wireless Wide-Area Network (WWAN) modem") that can be used to transfer data at least in public spaces. SAMSUNG-1005, ¶[0035], ¶[0088], FIG. 2; SAMSUNG-1003, ¶¶[50]-[51].



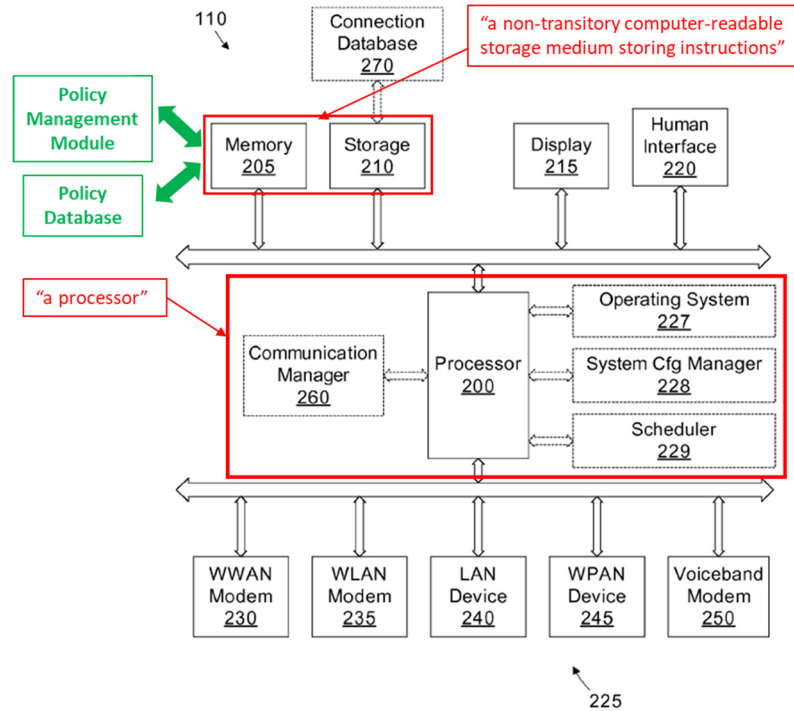
SAMSUNG-1005, FIG. 2 (modified based on D'Amore).

Additionally, in Cole, a “lengthy transfer [of a downloaded file] is conducted using the WWAN modem” over “a 3G channel” (“*WWAN*”). SAMSUNG-1005, ¶¶[0003]-[0004], [0031], [0035], [0064], [0067], [0088], [0112], FIG. 1. Thus, it would have been obvious to a POSITA that Cole’s WWAN modem is used to “*communicate data for network service usage activities between the wireless end-user device [110] and a WWAN.*” In addition, a POSITA would also have recognized or found obvious that the “3G channel” described by Cole is an example of a “*WWAN*” because Cole uses its “WWAN modem” for communication over this “channel,” and 3G networks were understood in the art to be an example of a WWAN. SAMSUNG-1005, ¶¶[0064], [0067], [0088], [0112]; SAMSUNG-1003,

¶[52]. Indeed, Cole explicitly describes a “3G WWAN network.” SAMSUNG-1005, ¶[0064]; SAMSUNG-1003, ¶[52].

[1.3]

Cole discloses a “memory 205 and/or storage device 210 [that] typically store various software applications for execution by the processor 200, such as user applications, an operating system 227, a system connection manager 228, a scheduler 229, device drivers,” and connection manager 260. SAMSUNG-1005, ¶[0033]-¶[0036]. As described below, the processor is configured to execute these applications (and any instructions therein) to implement the operations claimed in features [1.4]-[1.7]. Thus, it would have been obvious to a POSITA that the memory 205 and/or storage device 210 are “*a non-transitory computer-readable storage medium*” that “*stor[e] instructions that, when provided to the processor, cause the processor to*” perform the operations claimed in features [1.4]-[1.7]. SAMSUNG-1005, ¶¶[0033]-[0036], [0153], FIG. 2; SAMSUNG-1003, ¶[53].



SAMSUNG-1005, FIG. 2.

[1.4]

Cole describes software applications, executed by the processor, that include updaters that automatically connect to update their program or data files. SAMSUNG-1005, ¶[0124]. To accomplish updates, the updaters “interact with the scheduler 229 to schedule an update when it is identified as being available.”

SAMSUNG-1005, ¶¶[0124]-[0127], ¶¶[0034], [0153], FIG. 2. A POSITA would have recognized or found obvious that the processor “*receive[s] respective requests from a plurality of applications*” when a request to schedule an update is received from multiple software applications. SAMSUNG-1003, ¶[54]; *see supra* [1.1], [1.3]. Because communications from the software applications in the mobile

device 110 are conducted using a 3G WWAN network 130 and WWAN modem 230, as described above in [1.2], it would have been obvious to a POSITA that Cole's processor would have received "*request[s]*" to use the "*WWAN*" to accomplish updates (e.g., when "in a public place" or when the WLAN network is unavailable) because WWANs are fast networks in which updates would have been accomplished efficiently. SAMSUNG-1005, ¶¶[0064], [0088]; SAMSUNG-1003, ¶[54]. Indeed, in Cole's example where the user "selects a file for download" in a public place (such selection can be made when an update in a public place such as a subway station is desired), the initial network selection to perform the download is a "3G channel" (a "*WWAN*"). SAMSUNG-1005, ¶¶[0004] ("[in] locations where the user can not establish an Ethernet connection or a WLAN connection, a WWAN (i.e., over a cellular network) may be established"), [0088]; SAMSUNG-1003, ¶[54]. Moreover, Cole describes that, "if the user has an unlimited usage plan, the user might want to always prefer 3G" (the "*WWAN*") to accomplish activities. SAMSUNG-1005, ¶[0067]. Finally, Cole also describes various network service usage activities that can be performed over a wireless network such as the "*WWAN*." *Id.*, ¶¶[0009], [0073]-[0075], [0083]-[0089]; SAMSUNG-1003, ¶[54]. Based on Cole's description referenced above, a POSITA would have found it obvious that, when Cole's device is set to use a WWAN connection, Cole's background update requests from multiple applications are requests to access the

WWAN for background network service usage activities. SAMSUNG-1003, ¶[54].

Cole also explains that “[s]ome [software] applications may be classified as background applications, which typically operate without direct interaction from the user.” SAMSUNG-1005, ¶[0009]. Examples of “tasks” (“**background network service usage activities**”) performed by these background applications include synchronizing files or emails, updating program or data files, and downloading files from a browser SAMSUNG-1005, ¶¶[0009], [0080], [0085], [0088], [0122]-[0123]; SAMSUNG-1001, 12:58-67, 13:1-21. Tasks, such as “synchronizing files or emails,” are examples of background “**network service usage activities**” because they typically involve wireless network communication. SAMSUNG-1001, 12:58-60 (“a network service usage activity is any activity by the device that includes wireless network communication”); SAMSUNG-1003, ¶[55]. Moreover, Cole’s “**background**” network service usage activities are consistent with the examples of “**background**” network service usage activities in the ’773 patent, which include “background email downloads” and “application software updates.” SAMSUNG-1001, 8:38, 16:56-67, 17:1-2, 12:58-67, 13:1-21. As Dr. Traynor explains, a POSITA would have recognized or found obvious that other network service usage activities described in Cole would also have been performed

as “*background network service usage activities*,” for example, the “file download” and “synchronization” network service usage activities described by Cole. SAMSUNG-1005, ¶¶[0088]-[0089], [0124]-[0127]; SAMSUNG-1003, ¶[55]. For reasons similar to those discussed above, a POSITA would have found it obvious that, when Cole’s device is set to use a WWAN connection, these background activities of Cole are requests to access the WWAN for background network service usage activities. SAMSUNG-1003, ¶[55].

Finally, Cole’s “*background network service usage activities*” are “*associated with ... respective applications*.” SAMSUNG-1005, ¶¶[0009], [0080], [0085], [0124]-[0127]. For example, Cole describes “internal updaters” (“*background network service usage activities*”) that “update their program or data files” associated with “software *applications*.” SAMSUNG-1005, ¶[0124]. Dr. Traynor explains that Cole’s disclosure contemplates several other examples of network service usage activities that are “*associated with ... respective applications*.” SAMSUNG-1003, ¶[56]. For example, Cole describes a “file for download” (“*network service usage activity*”) while “surfing the web.” SAMSUNG-1005, ¶[0088]. As Dr. Traynor explains, “a POSITA would have recognized or found obvious that ‘surfing the web’ would have been performed with a browser ‘*application*,’ such that data downloaded (the ‘*background network service usage activity*’) while surfing the web would have been ‘associated’ with the browser.” SAMSUNG-

1003, ¶[56].

[1.5]

Cole discloses that the connection manager, controlled by the processor, “monitors the communication load” and “compares the monitored load to the bandwidth associated with the connection” to “determine periods of high load” (“**network busy state**”). SAMSUNG-1005, ¶¶[0034]-[0036], [0062], [0073]-[0077], [0088]-[0089] (“[the] connection manager 260 identifies the load on the WWAN modem” and “[the] connection manager 260 notices the load from the synchronization operation”), [0153], FIG. 2, FIG. 6A, FIG. 6B; SAMSUNG-1001, 11:64-67, 12:1; SAMSUNG-1003, ¶[59]; *see supra* [1.1], [1.3]. Moreover, Cole describes various ways in which the capacity limit of a communication channel is determined, for example, monitoring a queue associated with the device operating system, evaluating the signal to noise (SNR) of the channel, evaluating signal strength alone, and employing historical knowledge regarding the transfer speed peaks of the particular network (all “a characterization of the congestion ... of the network”). SAMSUNG-1005, ¶[0076]; SAMSUNG-1003, ¶[59]. Through these techniques, Cole determines a “**network busy state**” generally and renders obvious assessment of a current WWAN network busy state at a time of the background activities referenced in [1.4]. *Id.* As Dr. Traynor explains, a POSITA would have recognized or found obvious that this “network busy state” would have been the

“***current WWAN network busy state***,” as Cole describes “monitoring the load on an active connection” and tracking “connection times” and “metrics” for a “***WWAN***.” SAMSUNG-1005, ¶¶[0064]-[0065], [0067], [0074], [0031]; SAMSUNG-1003, ¶[59]. Moreover, Dr. Traynor notes that the “***current***” busy state would have been a useful indicator to the connection manager 260 and processor when evaluating the impact of busy state on the “efficiency of the user” as near-term busy state would have been the most impactful on applications in use by the user. SAMSUNG-1005, ¶¶[0064]-[0065], [0074]; SAMSUNG-1003, ¶[59].

Cole describes that, “[w]hen the monitored load exceeds a predetermined threshold,” the connection manager “may take one of several actions to manage the load.” SAMSUNG-1005, ¶[0075], *see also* ¶¶[0077]-[0082], FIG. 6A, FIG. 6B. For example, Cole describes that, “[f]or certain ***background*** tasks, the connection manager ... may postpone the actions automatically” (“***select a current corresponding service usage control policy***” for the “***background network service usage activities***”). SAMSUNG-1005, ¶[0085]. Here, for example, the postponement policy corresponds to the background tasks referenced in [1.4]. SAMSUNG-1003, ¶¶[57]-[58], [60].

The management of actions in Cole is consistent with the ’773 patent’s description of a “***service usage control policy***,” which describes managing certain activities by deferring them. SAMSUNG-1001, 12:20-23. Similarly, Cole describes

that, after postponing the network service usage activity, the connection manger “schedules a deferred action.” SAMSUNG-1005, ¶[0086], *see also* ¶[0087]. Cole provides an example of this process in the annotated figures presented below. SAMSUNG-1005, FIG. 6A (reproduced below), FIG. 6B (reproduced below), *see also* ¶[0088]. Cole’s management of actions (“*service usage control policies*”) is implemented by the connection manager, executed by the processor, which “*select[s]*” these actions when “the monitored load exceeds a predetermined threshold” (“*based at least in part on a current WWAN network busy state*”). SAMSUNG-1005, ¶¶[0075], [0073]; SAMSUNG-1003, ¶[61].

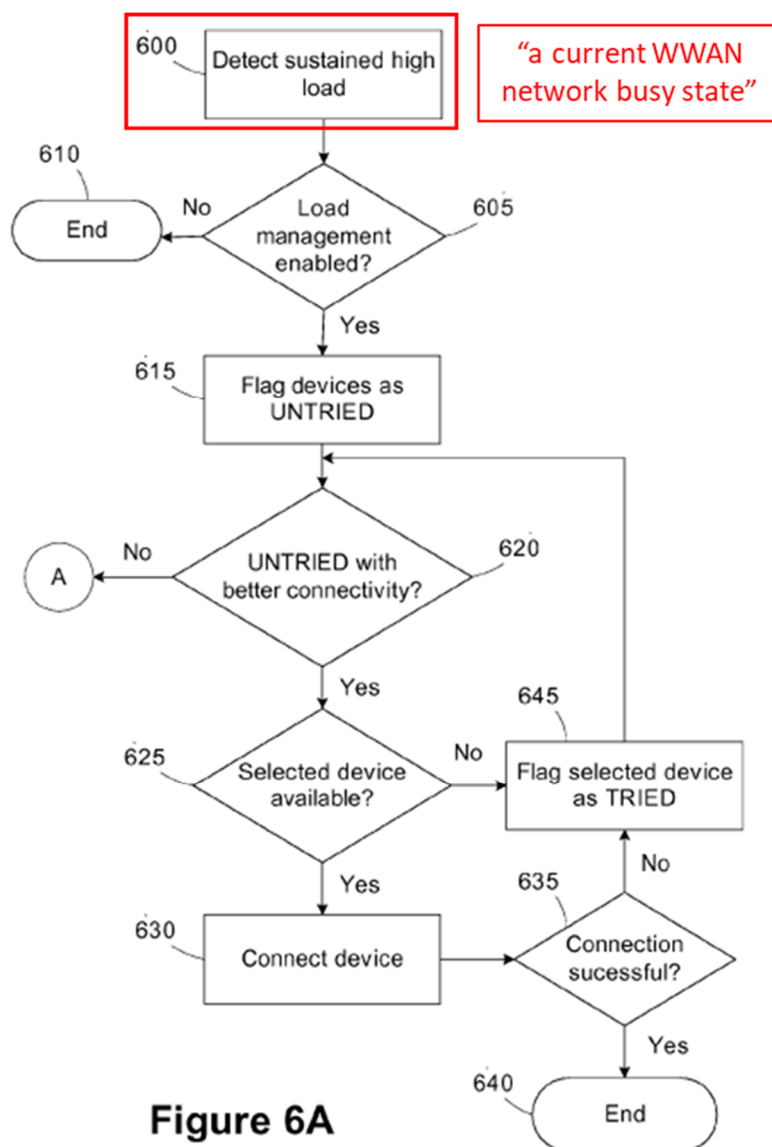


Figure 6A

SAMSUNG-1005, FIG. 6A.

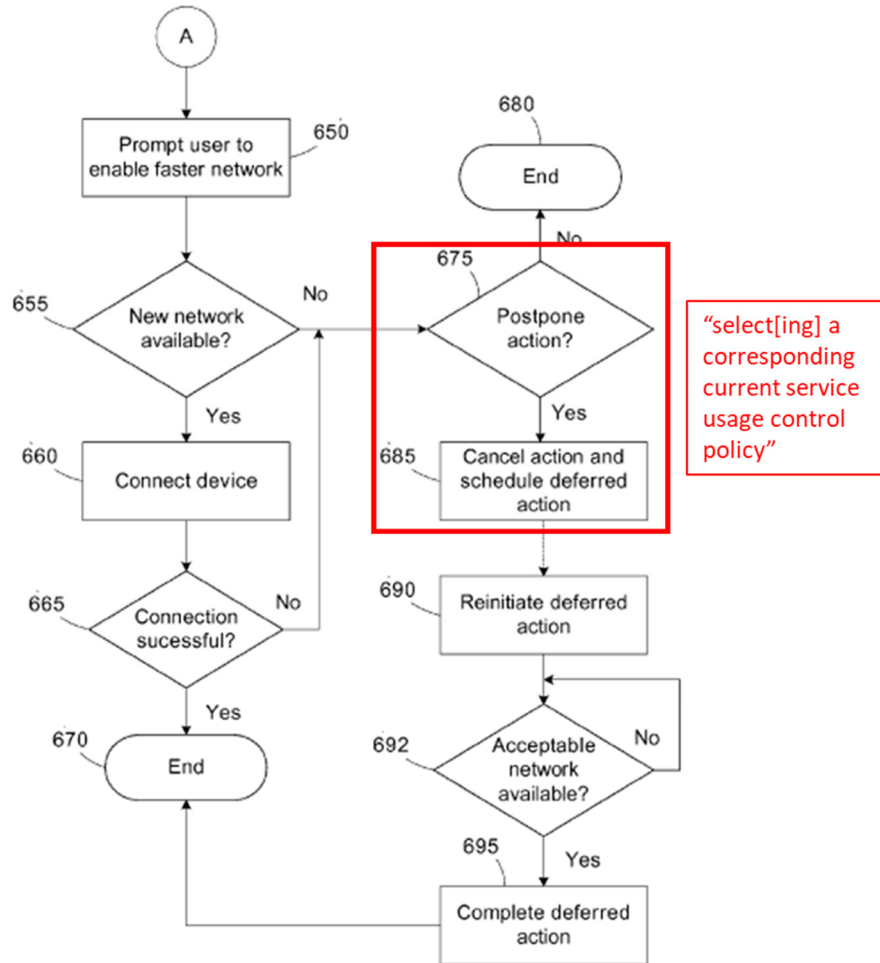


Figure 6B

SAMSUNG-1005, FIG. 6B.

[1.6]

Cole describes that, “[w]hen the monitored load exceeds a predetermined threshold” (“*during a time when the current WWAN network busy state indicates network congestion*”), the connection manager, executed by the processor, “take[s] one of several actions to manage the load.” SAMSUNG-1005, ¶¶[0034]-[0036],

[0075], [0153], FIG. 2; SAMSUNG-1003, ¶[62]; *see supra* [1.1], [1.3]. These actions include “determin[ing] if certain bandwidth activities (“*a selected subset of ... network service usage activities*”) should be aborted to preserve bandwidth for other applications.” SAMSUNG-1005, ¶[0075], ¶[0080], FIG. 6A, FIG. 6B; *see supra* [1.5]. These activities can include “a background application (e.g., synchronizing files or emails)” (“*a selected subset of the background network service usage activities*”). SAMSUNG-1005, ¶[0080]; SAMSUNG-1003, ¶[62].

Cole further discloses that “[t]he connection manager 260 reschedules the aborted activity at a later time, presumably when the bandwidth load will be decreased or a better connection will be available” (“*network congestion is no longer indicated*”). SAMSUNG-1005 ¶[0080], *see also* ¶[0087], ¶¶[0118]-[0127], FIG. 6A, FIG. 6B. A POSITA would have understood or found obvious that this later time, at which the activity is rescheduled (e.g., deferred to), is a time slot at which the activity is scheduled to be executed. SAMSUNG-1003, ¶[63]. Moreover, Cole describes that these “activities may be triggered by changes in connectivity state” (e.g., the “better connection” above, where “*network congestion is no longer indicated*”). SAMSUNG-1005, ¶[0122]. Thus, Cole’s rescheduling renders obvious “*determin[ing] respective deferred time slots for each of the background network service usage activities,*” as recited in claim 1.

As described above in the preceding claim elements, these “*respective deferred time slots*” are “*for each of the background network service usage activities*” and are “*based on the current service usage control policy*,” as the timeslots selected by the connection manager 260 and/or scheduler 229 take into consideration connectivity prerequisites and network busy state. SAMSUNG-1005, ¶¶[0009], [0080], [0073]-[0075], [0085]-[0087], [0118]-[0122]; SAMSUNG-1003, ¶[64]; *see supra* [1.4], [1.5]. Thus, it would have been obvious to a POSITA that Cole’s processor accesses each background network service usage activity (e.g., its prerequisites, network access requests) and, in view of the network state, assigns a priority level that corresponds to a specific time slot for deferral. SAMSUNG-1003, ¶[64]. In this manner, each activity is assigned a specific deferred time slot that corresponds to its priority level. SAMSUNG-1003, ¶[64].

Cole also describes that “[a]ctivities may be triggered by changes in connectivity state, such as ... the establishment of connectivity” and that “activities may be initiated in response to the level of connectivity changing, such as when the connectivity state changes to a high bandwidth state” (“*until network congestion is no longer indicated*”). *Id.*, ¶[0122]; SAMSUNG-1003, ¶[65]. Cole provides an example of this process in the annotated figure presented below.

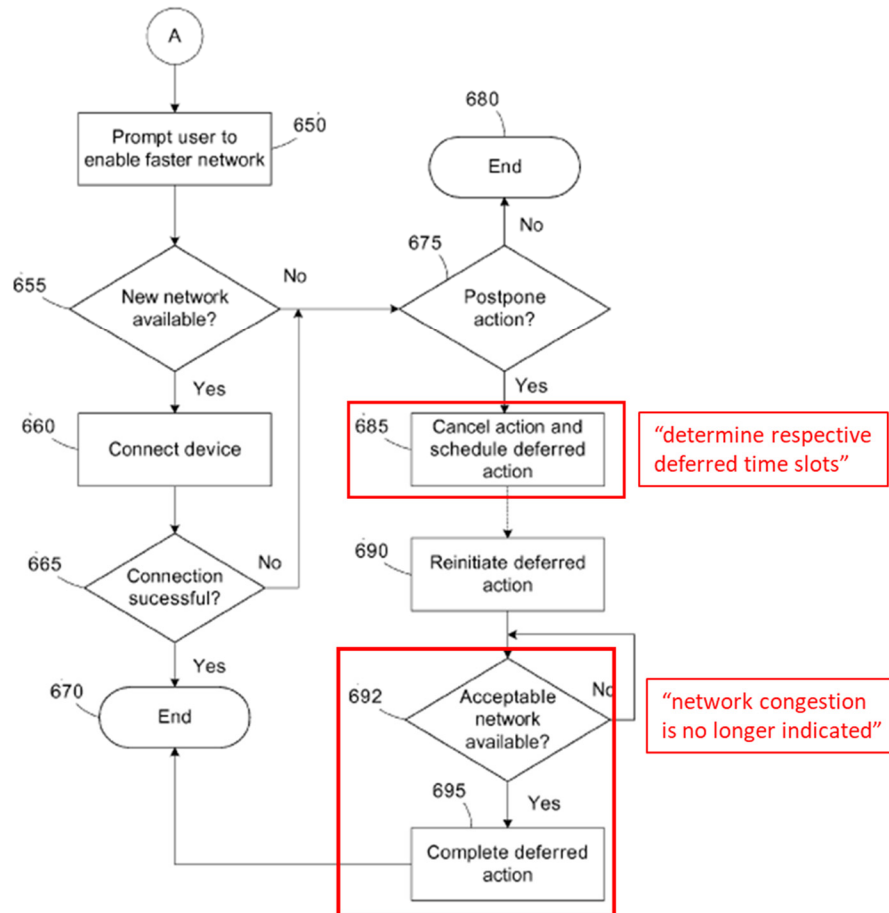


Figure 6B

SAMSUNG-1005, FIG. 6B.

Ground 1B also renders [1.6] obvious

Cole-D’Amore also renders the “*a selected subset*” feature obvious. SAMSUNG-1005, ¶[0080]. Specifically, D’Amore describes a “custom configuration database” within a “policy management module” that “stores a ... priority level relationship for a set of predetermined mobile applications” (“*a selected subset*”). SAMSUNG-1006, ¶[0070]. D’Amore teaches providing access to applications having higher priority level and deferring and removing access from applications

having a lower priority. SAMSUNG-1006, Abstract, ¶¶[0060], [0061], [0072].

Accordingly, it would have been obvious to a POSITA that when multiple applications are attempting to access the network at the same time (e.g., network congestion), a processor in the Cole-D'Amore system would have provided access to the application having a higher priority level and defer or remove access to the application having a lower priority level. SAMSUNG-1003, ¶[66]. When such a network service usage control policy is applied to a grouping of Cole's "***background network service usage activities***" (a "***selected subset***"), the selected subset of the background network service usage activities would have been "***deferred until network congestion is no longer indicated.***" SAMSUNG-1006, ¶[0070]; SAMSUNG-1005, ¶[0080]; SAMSUNG-1003, ¶[66]. Moreover, consistent with Cole's teachings described above, in the Cole-D'Amore system, such a deferral would have involved "***determin[ing] respective deferred time slots for each of the background network service usage activities based on the current service usage control policy.***" SAMSUNG-1003, ¶[66].

[1.7]

Recall from [1.4] that Cole's "updaters" would have requested to use the "***WWAN***" to accomplish updates (e.g., when "in a public place" or when the WLAN is unavailable) because WWANs are fast networks. SAMSUNG-1005, ¶¶[0064], [0088]; SAMSUNG-1003, ¶[67]. Additionally, Cole describes that,

when activities, such as Cole’s “*background network service usage activities*,” are deferred, they are “reinitiated by the connection manager ... at some later point in time,” for example, the deferred time slot described above in [1.6] (“allow each of the background network service usage activities to access the WWAN during the respective deferred time slot”). SAMSUNG-1005 ¶¶[0080], [0087], FIG. 6A, FIG. 6B; SAMSUNG-1003, ¶[67]; *see supra* [1.4], [1.6]. An annotated example process is reproduced below, where at step 692 an appropriate network is identified and the deferred activity is accomplished using this network (the activity is “*allow[ed]*” to access the network).

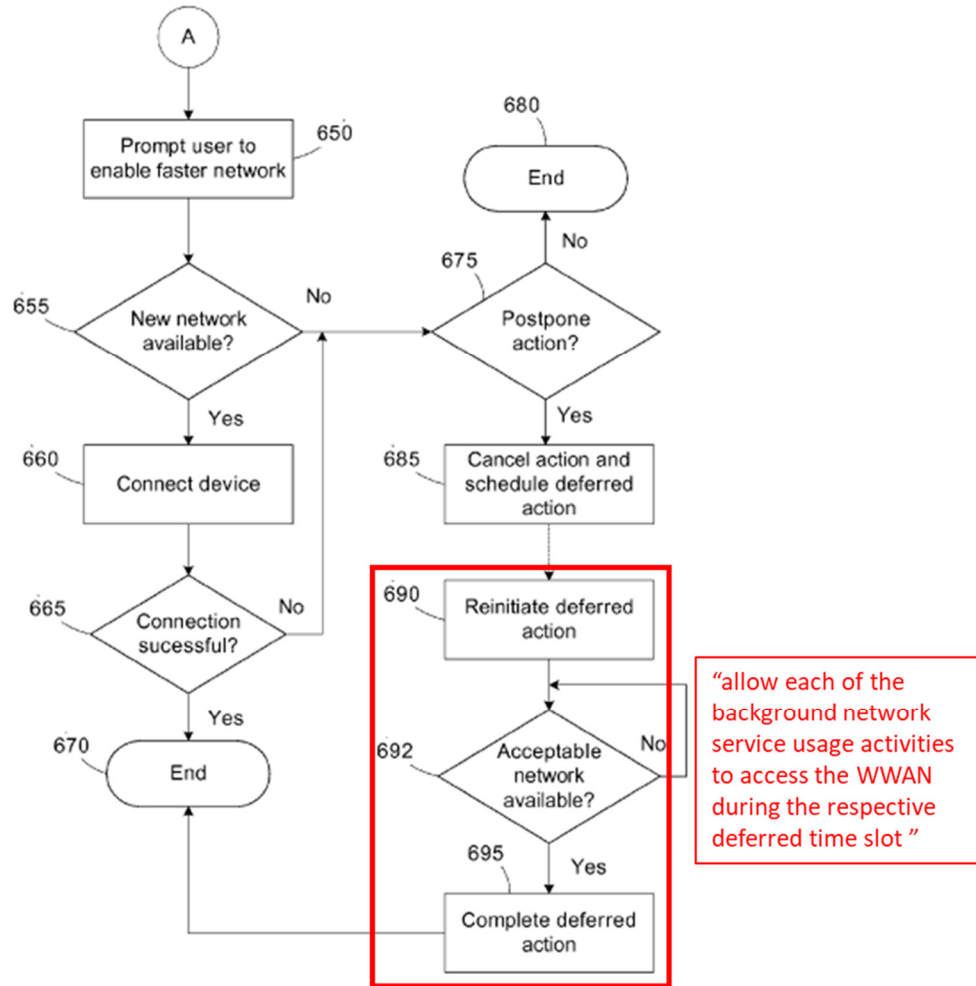


Figure 6B

SAMSUNG-1005, FIG. 6B.

Additionally, Dr. Traynor notes that “*allow*” in this limitation encompasses the background network service usage activity not being prohibited from accessing the WWAN during its *respective deferred timeslot*.” SAMSUNG-1003, ¶[68]. Cole does not make a prohibition of WWAN access during the deferred time, and therefore, satisfies this claim feature. SAMSUNG-1005, ¶¶[0088], [0121]-[0126]; SAMSUNG-1003, ¶[68].

Ground 1B also renders [1.7] obvious

Recall from the prior art mapping of [1.6] under Ground 1B that D'Amore discloses a control policy in which different priority levels (e.g., high or low) are assigned to applications (and associated tasks) and access by the lower priority applications is restricted or deferred when the network is congested. SAMSUNG-1006, Abstract, ¶¶[0060], [0061], [0070], [0072]; SAMSUNG-1005, ¶[0080]; SAMSUNG-1003, ¶[69]. Accordingly, when implementing this policy in the Cole-D'Amore system, which can defer low priority background network service usage activities (as described above), it would have been obvious to a POSITA that when such time slots are reached for “each of the background network service usage activities,” these low priority activities are then “allow[ed] ... to access the WWAN during the respective deferred time slot for that background network service usage activity.” SAMSUNG-1003, ¶[69].

[2]

Ground 1B renders [2] obvious

D'Amore describes that applications can be assigned priority levels (“*classified*” with “*respective priorities*”) with respect to one or more mobile resources. SAMSUNG-1005, ¶[0006]; *see supra* [1.6]. In particular, D'Amore describes a policy stored in a policy database and executed by a processor that “associates ... a priority level, or both, with at least one mobile application” and this association

“establishes a relative order of importance for the mobile application with respect to other mobile applications.” SAMSUNG-1005, ¶¶[0009], [0040]-[0043], [0049]-[0050], *see also* ¶¶[0051]-[0052]. Thus, “if the mobile application requests access to a mobile resource and has a higher order of importance than a competing application, the mobile application will be provided the access” (“*respective requests*” for resources, where each of the requests are “*classified*” with “*respective priorities*”). SAMSUNG-1005, ¶[0050]-[0052]. For example, “if a voice call application is given higher priority than a WAP browser application, a WAP browser session can be interrupted so that a mobile device can support an incoming voice call.” SAMSUNG-1006, ¶[0032]. In this manner, it would have been obvious to a POSITA that D’Amore “*classifies the respective requests with respective priorities*.” SAMSUNG-1003, ¶[70].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that in combining Cole with D’Amore, D’Amore’s priority levels would have been used by Cole’s connection manager, executed by the processor, to “*determine the selected subset of the background network service usage activities*” when implementing “*service usage control policies*,” and that this determination would have been “*based on the respective priorities of the respective requests*,” as this is consistent with the teachings of Cole, which describes preventing “latency” from some applications from impacting others. SAMSUNG-1005, ¶¶[0008]-

[0010], ¶[0074]; SAMSUNG-1003, ¶[71]; *see supra* [1.5], [1.6]. Recall in [1.5]-[1.6] that Cole’s connection manager 260 reschedules background activities during times of high busy state. *See supra*, [1.5]-[1.6]. For example, Cole describes that “applications with transfer video or audio in real-time cannot tolerate latency” while “[b]ackground applications may be less impacted by increased latency.” SAMSUNG-1005, ¶[0009]. In this scenario, the “background applications” would be deferred during times of high busy state to preserve bandwidth for the “real-time” applications (“*the selected subset of the background network service usage activities*” which are deferred by the “*service usage control [policy]*” based on their “*respective priorities*”). SAMSUNG-1005, ¶[0009]; SAMSUNG-1003, ¶[71].

Additionally, D’Amore describes that the “memory” that includes the “policy database 210” and “policy management module 212” is “operatively coupled to [a] processor” (“*the instructions provided to the processor further cause the processor to*”). SAMSUNG-1006, ¶[0050]; SAMSUNG-1003, ¶[72]. D’Amore also describes that this processor “include[s] a first module for associating ... priority level with a mobile application” and “a second module that approves or denies access to a system resource for the mobile application.” SAMSUNG-1006, ¶¶[0009], [0040]-[0041].

[3]

Ground 1B renders [3] obvious

D’Amore describes a policy management module 402⁵ that includes a custom configuration database 406, which includes a list of priority codes. SAMSUNG-1006, ¶¶[0050], [0068]-[0070]. The custom configuration database “stores a predetermined privilege code or priority level relationship for a set of predetermined mobile applications” and a “policy database” that “associates ... a priority level ... with at least one mobile application.” SAMSUNG-1006, ¶¶[0050], [0068]-[0070]. Given that priority codes are used by the policy management module 212 (or the connection manager 260 in Cole-D’Amore) to “deny access to a mobile device resource and/or mobile network resource for a mobile application,” these priority codes “*indicat[e] one or more applications having a network capacity control.*” SAMSUNG-1006, ¶¶[0051], [0068]. D’Amore describes that this predetermined priority level relationship can be provided by a mobile device manufacturer or network service provider (a “service plan” that defines the “*network capacity-controlled services list*”). SAMSUNG-1006, ¶[0070]; SAMSUNG-1003, ¶[73].

⁵ D’Amore also numbers the same policy management module 402 as component “212” and “302.” SAMSUNG-1006, FIG. 2, FIG. 3.

Additionally, D'Amore describes "dynamic priority" which includes "modification or update of priority level(s) of one or more applications ... based on current state of a mobile [Operating Environment] OE" or "as a function of mobile OE state." SAMSUNG-1006, ¶¶[0068]-[0069]. D'Amore describes "mobile OE states" as including "access to one or more ... network resources" (a "network busy state"). SAMSUNG-1006, ¶[0068]. Dr. Traynor explains that, in combining D'Amore with Cole, D'Amore's custom configuration database ("***network capacity controlled services list***") would initially be set by a network service provider and dynamically adjust priority as a function of one or more network resources (a "network busy state"). SAMSUNG-1003, ¶[74]. Dr. Traynor explains that, in doing so, this arrangement would "provide useful flexibility, and serve consumer/service provider needs for a wide range of requirements and use cases." SAMSUNG-1006, ¶[0068]; SAMSUNG-1003, ¶[74].

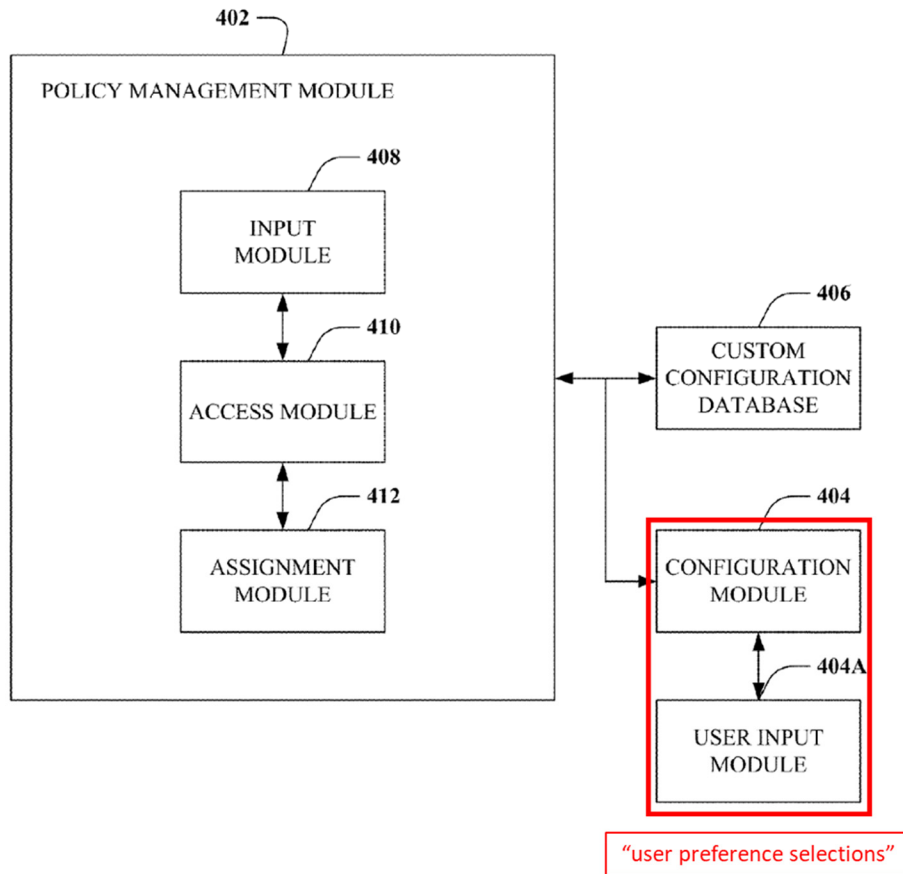
Recall that in [2], priority levels are used to classify application requests. *See supra*, [2]. In view of the above, the Cole-D'Amore connection manager would reference the "custom configuration database 406" when "***classify[ing] the respective requests with respective priorities***" as this database is the repository of information used for classification. SAMSUNG-1006, ¶¶[0068]-[0070]. Thus, when "***assigning a respective priority to a request***," the assignment is performed "***based on the network capacity-controlled services list***," as the information used

to assign a priority is retrieved from this data source. SAMSUNG-1006, ¶¶[0068]-[0070]; SAMSUNG-1003, ¶[75]; *see supra* [1.5], [1.6], [2].

[4]

Ground 1B renders [4] obvious

Recall that in [2]-[3] the custom configuration database of D’Amore stores priority levels for applications. *See supra*, [2]-[3]. D’Amore also describes a “configuration module 404” and a “*user* input module 404A” that allows a “*user*” to “set and/or modify a priority level of a mobile application ... as a function of mobile resource” (“*user preference selections*”). SAMSUNG-1006, ¶[0063], ¶[0070], SAMSUNG-1003, ¶[76]; *see supra* [3]. As illustrated below in FIG. 4, D’Amore’s configuration module 404 “provide[s] custom access to the predetermined relationship” stored in the custom configuration database 406 by the way of the user input module 404A. SAMSUNG-1006, ¶[0070], FIG. 4; SAMSUNG-1003, ¶[76].



SAMSUNG-1006, FIG. 4.

[5]

Recall above in [1.6] that Cole’s connection manager 260 defers and re-schedules application activities when high busy state is indicated. SAMSUNG-1005 ¶[0080], *see also* ¶[0087], ¶¶[0118]-[0127]; *see supra* [1.6]. Cole describes that the connection manager additionally “**block[s]**” network service usage activities that do not meet defined prerequisites after scheduling these activities. SAMSUNG-1005, ¶¶[0124]-[0126]; *see supra* [1.4], [1.6]. Because Cole’s scheduler 229 “tracks various prerequisite conditions associated with the tasks it schedules,”

the “*respective deferred time slot[s]*” selected by the scheduler would satisfy these prerequisites. SAMSUNG-1005, ¶[0119]; SAMSUNG-1003, ¶[79].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that Cole’s scheduler or connection manager would “[*block*] or [*delay*] *execution*” of the “*application associated with a given background network service usage activity*” until “*the respective deferred time slot is reached.*” SAMSUNG-1005, ¶[0009], ¶[0119], ¶[0121], ¶[0125]; SAMSUNG-1003, ¶[80]; *see supra* [1.7]. For example, Cole describes that execution of the application and network service usage activity before connectivity prerequisites are satisfied may result in “increased latency” for the connection and “negatively [impact]” other applications. SAMSUNG-1005, ¶¶[0009] (“applications with transfer video or audio in real-time”), [0119]-[0125]; SAMSUNG-1003, ¶[80]; *see supra* [1.7]. Moreover, “*blocking*” internal updaters (“*applications*”) from proceeding with updates (“*background network service usage activities*”) outside of times that meet their connectivity prerequisites (“*respective ... time slot*”) is described in Cole. SAMSUNG-1005, ¶[0125]; SAMSUNG-1003, ¶¶[77]-[78], [80].

Ground 1B renders [5] obvious

Recall that D’Amore teaches providing access to applications having higher priority level and deferring and removing access from applications having a lower priority. *See supra* [1.6]-[1.7]. Accordingly, it would have been obvious to a

POSITA that when removing access from an application, the Cole-D'Amore connection manager would “**block**” or “**delay**” the activity until its “**respective deferred time slot**” is reached. *See supra* [1.6]-[1.7]; SAMSUNG-1003, ¶[81].

[6]

Recall above in [1.6] that Cole’s connection manager 260 defers and re-schedules application activities when high busy state is indicated. SAMSUNG-1005 ¶[0080], *see also* ¶[0087], ¶¶[0118]-[0127]; *see supra* [1.6]. Also recall that rescheduling an application activity includes selecting a “**deferred time slot**” that satisfies activity prerequisites. SAMSUNG-1005, ¶[0119]; *see supra* [5]; SAMSUNG-1003, ¶[82].

Cole describes that the scheduler can “[pass] fixed parameters to [a] target task” (“**informing an application associated with a given background network service activity**”). SAMSUNG-1005, ¶[0118]. As Dr. Traynor explains, a POSITA would have recognized or found obvious that the scheduler would “**[inform] an application associated with a given background network service activity when the WWAN is available for that activity,**” at multiple points, and for multiple reasons. SAMSUNG-1003, ¶[83].

First, Dr. Traynor explains that “the application requesting to schedule a background network service usage activity would need to be informed of the connection manager’s scheduling decision (“**when the WWAN is available for that**

activity”) in order for that application to know to cease requesting network access.

SAMSUNG-1003, ¶[84]. Otherwise, the connection manager and scheduler would repeatedly receive access requests from the same application, which would have been unaware that its network service usage activity had already been allotted a time to access the network.” SAMSUNG-1005, ¶[0125], ¶[0126], FIG. 9; SAMSUNG-1003, ¶[84].

Second, Dr. Traynor explains a POSITA would have understood or found obvious that, once the “*respective deferred time slot*” is reached, the connection manager 260 would “*inform*” the application that the “*WWAN is available for that activity*” in order to begin execution. SAMSUNG-1003, ¶[85]; *see also* SAMSUNG-1006, ¶[0061]. Indeed, Cole describes that once connectivity requirements are met, the scheduler 229 initiates activities. SAMSUNG-1005, ¶¶[0118]-[0123]. In order for this to occur, the scheduler 229 would need to “inform” the application of its decision to initiate the application’s activity because the “*WWAN is available for that activity*.” SAMSUNG-1005, ¶¶[0118]-[0123]; SAMSUNG-1003, ¶[85].

Third, Dr. Traynor explains that “a POSITA would have recognized or found obvious from Cole’s disclosure that there is routine and proactive communication regarding network connectivity between the connection manager, scheduler,

and requesting applications.” SAMSUNG-1003, ¶[86]. For example, Cole describes that an “application program may check the power and connectivity states itself (“*when the WWAN is available for [the] activity*”) or interact with the scheduler ... to schedule an update” and also “check for an update if connectivity was available, and responsive to finding an update, schedule a task with the scheduler ... including the power and connectivity prerequisites.” SAMSUNG-1005, ¶[0126]. From these above interactions, “a POSITA would have recognized that the application-scheduler relationship is proactive, and the scheduler or connection manager would “*inform*” the application of connectivity changes that affect the application, for example, so the application would know to initiate a network service usage activity in response to an increase in connectivity.” SAMSUNG-1005, ¶¶[0122]-[0123]; SAMSUNG-1003, ¶[86].

Ground 1B renders [6] obvious

Recall that D’Amore teaches providing access to applications having higher priority level and deferring and removing access from applications having a lower priority. *See supra* [1.6]-[1.7]. Accordingly, it would have been obvious to a POSITA that when removing access from an application, the Cole-D’Amore connection manager would “*[inform] an application associated with a given background network service activity when the WWAN is available for that activity*” because D’Amore also describes the rescheduling of activities when resources are

denied. SAMSUNG-1006; ¶[0061]; *see supra* [1.6]-[1.7]; SAMSUNG-1003, ¶[87].

[7]

Cole describes that tasks that are unsuitable for the WWAN can be performed over “*a different network, other than the WWAN*” (e.g., the “WLAN”). SAMSUNG-1005, ¶¶[0042], [0067], [0088]-[0089]. Moreover, Cole describes that the connection manager recognizes that “a user may not want to use a 3G network (a “*WWAN*”) ... because the use may incur added costs per connection” and that the connection manager “attempts to establish connectivity to the fastest eligible connection based on the connection time data and the user's preferences.” SAMSUNG-1005, ¶[0067]; SAMSUNG-1003, ¶[88].

For example, Cole describes:

In one example, the user is surfing a web site and selects a file for download [*“a background network service usage activity”*]. The file it [sic] larger than the user anticipated and is taking a long time to transfer. The user is in a public place and the lengthy transfer is conducted using the WWAN modem 230 (e.g., a 3G channel), which consumes significant battery power. ... A better connection is not available in the public setting, so the user opts to be reminded to download the web file later [a “*service usage control policy*” that “*defer[s] at least*

*one of the background network service usage activities”]. When the user returns home, ... and the communication manager 260 connects using the WLAN modem 235 (e.g., a Wi-Fi connection) [“**a different network, other than the WWAN**”], the connection manager 260 reminds the user to download the file [“**communicate data for that [sic] at least one of the background network service usage activities**”].*

SAMSUNG-1005, ¶[0088]; SAMSUNG-1003, ¶[89].

As described above, Cole’s memory “store[s] various software applications for execution by the processor” (“**the instructions provided to the processor further cause the processor to ...**”). SAMSUNG-1005, ¶¶[0034]-[0036], [0153], FIG. 2; SAMSUNG-1003, ¶[90]; *see supra* [1.1], [1.3].

[8]

Recall in [7], Cole describes that tasks that are unsuitable for the WWAN network can be performed over another network (e.g., the “WLAN”). SAMSUNG-1005, ¶¶[0042], [0067], [0088]-[0089]; *see supra* [7]. Additionally, Cole describes that the connection manager “evaluates” many features when selecting a “communication interface” to include “availability, bandwidth, user preferences, application requirements, [and] mobile device resources”. SAMSUNG-1005, ¶¶[0035]-[0036]; SAMSUNG-1003, ¶[91].

For example, Cole describes that the connection manager “stores records in

the connection database ... for previously encountered networks.” SAMSUNG-1005, ¶[0052]. Cole describes that, “if the same array of networks is identified, it is likely that the user frequents the location” and the connection manager can “track the user's preferences in the particular location.” *Id.* The use of user preferences is referenced throughout Cole, which also describes that “the user may be provided with a list of available connections from which to choose an initial connection preference”, and “a user may be able to set preferences for fast connect, including disabling the function entirely or selecting particular networks that may or may not be used” (“*a specific network selection*”). *Id.*, ¶[0042], ¶[0067], *see also* ¶[0053], ¶[0058], ¶[0062], ¶[0144]; SAMSUNG-1003, ¶[92].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that, when selecting a “*different network*” to accomplish “*at least one of the background network service usage activities*,” the connection manager would consider “*a specific network selection*” for the network service usage activity as this is consistent with the connection manager’s use of user preferences for specific networks. SAMSUNG-1003, ¶[93]. For example, Cole provides an example of deferring a “*background network service usage activity*” (a “synchronization operation”) until “*a specific network selection*” is available (a “LAN”). SAMSUNG-1005, ¶[0089]; SAMSUNG-1003, ¶[93]; *see supra* [7].

[10]

Cole describes that the “connection manager 260 [executed by the processor] may change the configuration of the communication functions in direct response to the *power state* of the mobile device.” SAMSUNG-1005, ¶¶[0087]-[0098], FIG. 7; SAMSUNG-1003, ¶[94]. For example, Cole describes, “when an early battery alarm occurs, the connection manager 260 attempts to move to a lower power/lower thermal communication link” (“*select different service usage control policies*”). Additionally, Cole describes that, in reacting to device power state, “if the mode change is associated with an increased *power state* (e.g., connection to AC power or change to high performance mode), the connection manager 260 ... establishes the connection normally using the ‘best’ connection technique” (“*select different service usage control policies*”). SAMSUNG-1005, ¶[0098]; SAMSUNG-1003, ¶[94]. An example process of Cole’s connection manager responding to power state is reproduced and annotated below.

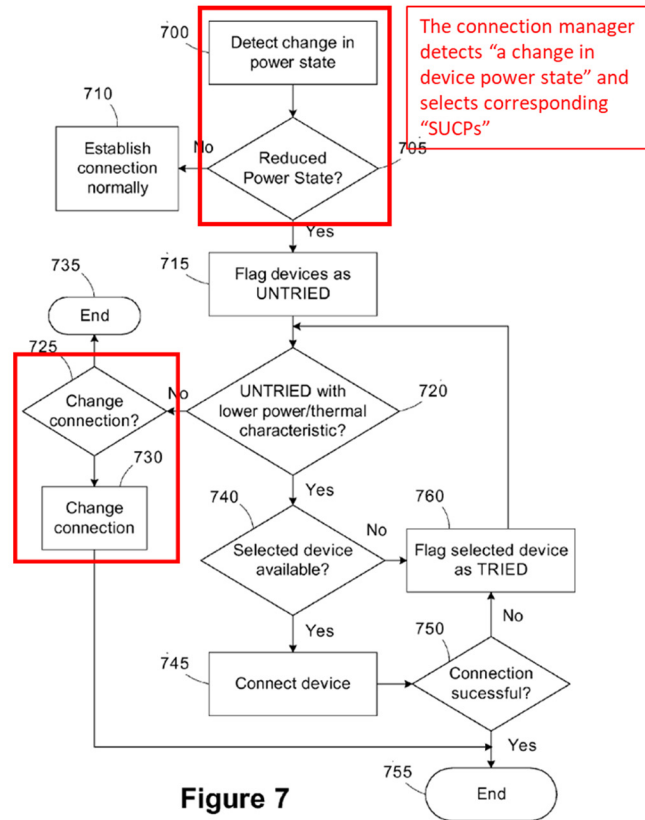


Figure 7

SAMSUNG-1005, FIG. 7.

Moreover, Cole describes that “the user may specify when scheduling a task, that the task should be blocked unless the mobile device 110 is connected to external AC power” and that the connection manager 260 “may be configured to block ... updates unless the defined prerequisites are met (e.g., rich connectivity is available, sufficient battery life is available, the battery is charged and the line power is provided, etc.).” SAMSUNG-1005, ¶[0119], ¶[0125]; SAMSUNG-1003, ¶[95].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that the connection manager’s consideration of “*power state*” would have been

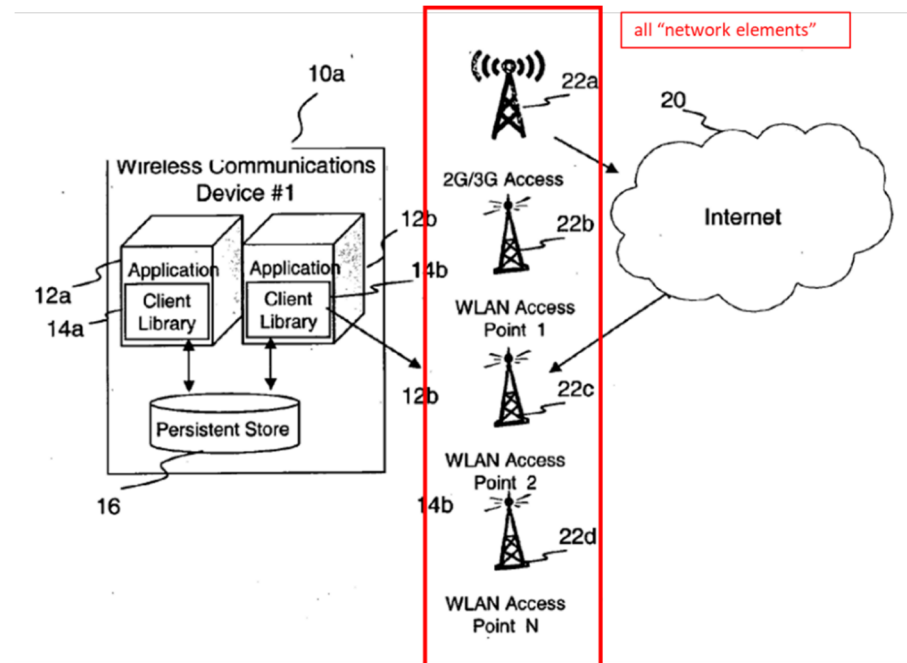
“in addition to the current WWAN network busy state” as Cole’s connection manager is described as considering both “prerequisites” (“rich connectivity” and “sufficient battery life”). SAMSUNG-1005, ¶[0125]; SAMSUNG-1003, ¶[96]. For example, an activity that may meet connectivity requirements may be deferred because of device power state (a *“selection of different service usage control policies based at least in part on, in addition to the current WWAN network busy state, a power state”*). SAMSUNG-1005, ¶[0125]; SAMSUNG-1003, ¶[96].

[13]

Cole describes that the connection manager “may use other information to determine if the capacity limit of the channel is met” to include information received from the channel, such as “SNR,” “signal strength alone,” and “transfer speed peaks of the particular network” (all information *“received from a network element via the WWAN”*). SAMSUNG-1005, ¶[0076]; SAMSUNG-1003, ¶¶[97]-[98].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that Cole’s connection manager would obtain information *“via the WWAN”* (e.g., a “3G channel”) from a *“network element”* (similar to a “base station”) as this was well known in the art. SAMSUNG-1005, ¶[0031], ¶[0035]; SAMSUNG-1003, ¶[99]. For example, Scahill, a U.S. patent publication directed to a “data

transmission scheduler” describes “access points” (“*network elements*”) in communication with a “wireless communications device,” to include “2G/3G” access points. SAMSUNG-1018, ¶[0114], FIG. 1A; SAMSUNG-1003, ¶[99]. An example of an access point is illustrated below.



SAMSUNG-1018, FIG. 1A.

[14]

Cole describes that the connection manager “may use other information to determine if the capacity limit of the channel is met” to include “monitor[ing] the queue for the channel by interfacing with the operating system,” evaluating “SNR,” evaluating “signal strength alone,” and determining “transfer speed peaks of the particular network” (all “*current network busy state*”). SAMSUNG-1005, ¶[0076]. Additionally, because Cole’s processor is “operable to implement [the]

connection manager,” the connection manager determining any of the above information “*cause[s] the processor to generate the current network busy state.*”

SAMSUNG-1005, ¶¶[0015], ¶¶[0076]; SAMSUNG-1003, ¶¶[100].

[15]

Ground 1B renders [15] obvious

Cole describes that its connections are associated with a “service provider” and have an associated “usage plan” (“*a service plan active on the device*”). SAMSUNG-1005, ¶¶[0128]-[0133]. Relatedly, the priorities in D’Amore’s custom configuration database are initially set by a service provider. *See supra* [2]-[4]. As described above, the Cole-D’Amore custom configuration database, set as part of the service provider’s usage plan (“*a service plan active on the device*”) and executed by the Cole-D’Amore processor by way of the connection manager 260, includes “*service usage control policies*” (e.g., priority policies) which are selected by the connection manager 260 responsive to “*WWAN network busy state.*” SAMSUNG-1005, ¶¶[0074]-[0076], [0085]; SAMSUNG-1006, ¶¶[0068]-[0070]; *see supra* [1.5]. Also recall that the Cole-D’Amore device executes background activities. *See supra*, [1.4]. Dr. Traynor explains that, in combining D’Amore with Cole, D’Amore’s “custom configuration database” (“*network capacity-controlled services list*”) would have initially been set by a network service provider, as part of a usage plan, and would have dynamically adjusted priority as a function

of one or more network resources (“***the service plan including network busy state-based criteria restrictions that apply to network capacity-controlled services, including one or more of the background network service usage activities***”). SAMSUNG-1003, ¶[101]. Dr. Traynor explains that, in doing so, this arrangement would have “provide[d] useful flexibility, and serve consumer/service provider needs for a wide range of requirements and use cases.” SAMSUNG-1006, ¶[0068]-[0070]; SAMSUNG-1003, ¶[101].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that the connection manager’s consideration of the policies within the custom configuration database would have been “***in addition to the current WWAN network busy state***” as the custom configuration database itself, using dynamic priority, is based on “***current WWAN network busy state.***” SAMSUNG-1006, ¶[0068]-[0070]; SAMSUNG-1003, ¶[102].

[20]

Recall above that Cole’s connection manager 260 and/or scheduler 229 “***determine respective deferred time slots for each of the background network service usage activities.***” See *supra*, [1.5]-[1.6]. Cole also describes that the scheduler 229 can “initiate tasks that are overdue” (“***a first time delay has occurred since a previous deferred time slot***”) due to “the connectivity prerequisite not being pre-

sent when the scheduler 229 first attempted to initiate the task” (“*a previous deferred time slot*”). SAMSUNG-1005, ¶[0123]. Indeed, Cole describes that “if a task requiring connectivity was blocked at its scheduled time, the scheduler 229 can execute the task at the first opportunity when connectivity is restored” (“*a first time delay has occurred since a previous deferred time slot*”). SAMSUNG-1005, ¶[0123]; *see supra* [1.6]. Additionally, Cole describes that “the user can specify that the task should be skipped and retried at its next scheduled time (“*a first time delay has occurred since a previous deferred time slot*”). SAMSUNG-1005, ¶[0123]; SAMSUNG-1003, ¶[103].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that the scheduler “[*delays*] a time slot” for the network service usage activity when prerequisites are not “present,” as Cole describes that “[if] connectivity does not exist, the update fails.” SAMSUNG-1005, ¶[0123]; SAMSUNG-1003, ¶[0104]. Thus, for scenarios where satisfying the “prerequisite” may not be imminent, the scheduler would “[*delay*] the time slot” to prevent failure of the activity, or “negative effects” to the device. SAMSUNG-1005, ¶[0123]; SAMSUNG-1003, ¶[104].

Ground 1B renders [20] obvious

Recall that D’Amore teaches providing access to applications having higher priority level and deferring and removing access from applications having a lower

priority. *See supra* [1.6]-[1.7]. Accordingly, it would have been obvious to a POSITA that when removing access from an application, the Cole-D'Amore connection manager is capable of “*delaying a time slot for a particular one of the background network service usage activities at least until a first time delay has occurred*” because D'Amore also describes rescheduling activities when resources are denied. SAMSUNG-1006; ¶[0061] (“periodically re-initiate resource requests”); *see supra* [1.6]-[1.7]; SAMSUNG-1003, ¶[105].

B. [GROUNDS 1C AND 1D] – Claims 9, 11-12, 16, and 18-19 are rendered obvious by Cole and Rao [1C], and/or Cole, D'Amore, and Rao [1D]

1. Overview of Rao

Rao discloses performing “intelligent and client centric prioritization of application network communications on a client based on the type and/or priority of an application.” SAMSUNG-1007, ¶[0179], FIG. 5A. As Rao’s method can be used to prioritize “data communications” of some applications over others (e.g., “real-time data communications” over data communications from “non-real-time data communication applications”), and can be used to “compliment Quality of Service (QOS) networks where network traffic prioritization occurs in intermediary network devices, such as switches and routers.” SAMSUNG-1007, ¶[0184]. In order to effectuate this prioritization, Rao describes the use of a “packet capture

mechanism” that “inspects” the network packets of applications and a “frame monitor” that “identifies an application ... that generated the packet.” SAMSUNG-1007, ¶[0109], ¶¶[0158]-[0159], ¶[0176], ¶[0180], ¶[0185], ¶[0191], FIG. 5A; SAMSUNG-1003, ¶[106].

As shown in Rao’s FIG. 5A below, Rao discloses that a “remote access client 105 of computing device 102 is connected to network 104” through one or more “LAN or WAN links” and/or “wireless connections.” SAMSUNG-1007, ¶[0179]. Further, “[t]he client 105 may execute one or more applications 338a-338n, which access the network 104 via the agent 326 and filter 322 of the remote access client 120.” SAMSUNG-1007, ¶[0179]. As examples, Rao’s applications can communicate with one or more servers on the network 104, such as “an application server providing email services such as Microsoft Exchange,” “a web or Internet server,” “a desktop sharing server,” or “a collaboration server.” SAMSUNG-1007, ¶[0090]; SAMSUNG-1003, ¶[107].

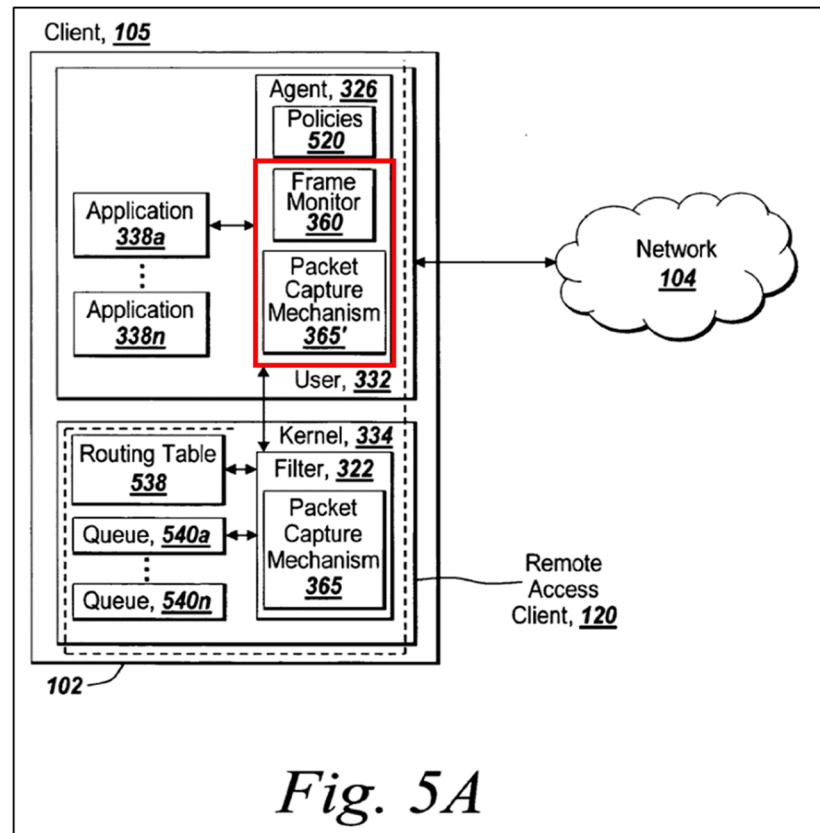


Fig. 5A

SAMSUNG-1007, FIG. 5A.

Rao's system implements "one or more policies 520 for specifying client-side prioritization of network communications related to applications 338 a-338 n." SAMSUNG-1007, ¶[0182]. These policies "may be specified by any suitable means and/or mechanisms." SAMSUNG-1007, ¶[0182]. For instance, these policies can "define prioritization" based on criteria such as: "the name of the application," "the type of application," "the type of one or more protocols used by the application[s]," "the size of the payload of the network packet," "whether an application is running in the foreground or the background of the client," and/or "the destination network address, such as host name or IP address, and/or destination port

number.” SAMSUNG-1007, ¶[0182]; SAMSUNG-1003, ¶[108].

Rao deploys these policies by intercepting packets of network traffic associated with applications, determining the priority of the packets based on the application that is associated with each packet, and selectively communicating the packets to the network based on the determined priority. SAMSUNG-1007, ¶¶[0184]-[0190], FIG. 5B. As an example, Rao’s system can “use the policies 520 to determine which network packets to queue and/or discard.” SAMSUNG-1007, ¶[0207]. In particular, Rao’s system includes “a packet capture mechanism 365, 365” (annotated above in Figure 5A) for “intercepting network traffic of any of the applications 338a-338n of the client 105.” SAMSUNG-1007, [0080], [0184]-[0186], FIG. 5A; SAMSUNG-1003, ¶[109].

2. Combination of Cole/Cole-D’Amore and Rao

It would have been obvious to a POSITA to modify the Cole system or the Cole-D’Amore system based on the teachings of Rao such that Rao’s packet assessment and prioritization techniques (e.g., packet capture mechanism 365, frame monitor 360, API techniques, and additional prioritization techniques) would have been incorporated in the Cole or Cole-D’Amore mobile devices. SAMSUNG-1005, ¶¶[0074]-[0097], FIG. 2; SAMSUNG-1007, ¶¶[0158]-[0159], ¶[0176], ¶[0180], ¶[0185], ¶[0191], FIG. 5A; SAMSUNG-1003, ¶[110]. As Dr. Traynor explains, a POSITA would have been motivated to update the Cole or Cole-

D'Amore mobile device based on the teachings of Rao for the following reasons:

- 1) Incorporating the functionality of Rao's frame monitor 360 into the connection manager of the Cole or Cole-D'Amore devices would beneficially provide the Cole or Cole-D'Amore system with an additional capability to identify application traffic at the packet level, allowing for inter-application classification of activities based on protocol. SAMSUNG-1007, ¶[0109], [0179]-[0184]; SAMSUNG-1003, ¶[111].
- 2) A POSITA would have recognized that Rao describes prioritization techniques (e.g., "whether an application is running in the foreground or the background") that would enhance the priority policies of the Cole or Cole-D'Amore device, allowing more accurate prioritization decisions to be made (e.g., deferring an active browsing session or a call in progress). SAMSUNG-1006, ¶[0059]-[0061]; SAMSUNG-1007, ¶[0109], ¶[0179]-[0184], FIG. 5A; SAMSUNG-1003, ¶[112].

As explained below, combining Cole or Cole-D'Amore with the teachings of Rao would have involved (1) combining prior art elements according to known methods to yield predictable results; and (2) using known technique to improve similar devices in the same way. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007); MPEP 2143; SAMSUNG-1003, ¶[113]. Indeed, Cole describes policy decisions similar to Rao (the "actions" of the

connection manager 260 to defer or reschedule activities— similar to Rao’s agent 326) and the incorporation of Rao’s known prioritization methods into Cole would have yielded predictable results. SAMSUNG-1005, ¶¶[0074]-[0075]; SAMSUNG-1007, ¶[0040] (“preventing” and “holding” activity traffic). Moreover, because Cole’s connection manager “proactively prevent[s] increased latency from an overloaded connection from impacting the performance of the running applications,” a similar design objective to Rao, the use of Rao’s prioritization techniques in Cole would have been improving a similar device in the same way. SAMSUNG-1005, ¶[0074]; SAMSUNG-1007, ¶[0179] (“prioritization of application network communications on a client based on the type and/or priority of an application”); SAMSUNG-1003, ¶[113].

Incorporating Rao’s packet assessment and prioritization techniques (e.g., packet capture mechanism, frame monitor, and additional prioritization techniques) into Cole and the Cole-D’Amore devices would have been predictable and foreseeable with a reasonable expectation of success because Rao also describes “optimizing ... communications” on mobile devices that “run one or more applications 338 that access a network” (“effectively use the available bandwidth”). SAMSUNG-1005, ¶¶[0074]-[0097], ¶[0104]; SAMSUNG-1007, ¶[0075], ¶[0088], ¶[0133], ¶¶[0179]-[0184]. Like Cole and D’Amore, Rao describes that its techniques can be implemented in end-user devices (“mobile telephones”). SAMSUNG-1005,

¶¶[0014]-[0015], SAMSUNG-1006, ¶¶[0007]-[0016]; SAMSUNG-1007, ¶[0130].

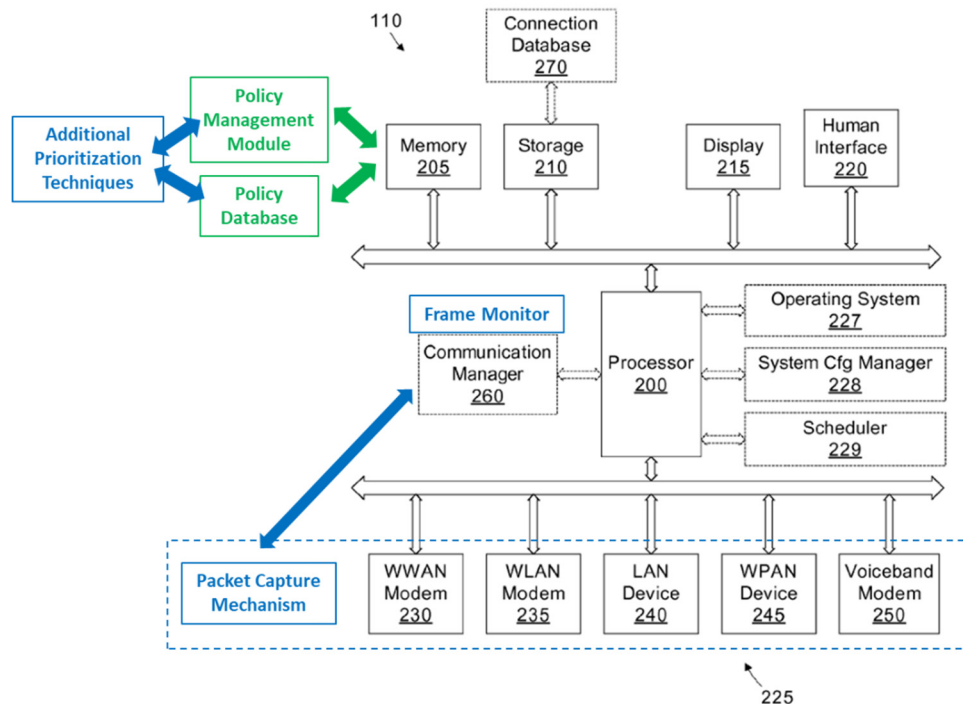
Additionally, as Dr. Traynor explains, the use of computer program modules to monitor and identify application packet flow on mobile devices was known as of the Critical Date. SAMSUNG-1003, ¶[114]. Kelz (a European patent application) corroborates Dr. Traynor's explanation and describes a "controller module" that includes a "QoS packet processor" which can "monitor the packet flow" of applications. SAMSUNG-1010, ¶[0036]. Therefore, a POSITA would have had a reasonable expectation of success in implementing the teachings of Rao into Cole and Cole-D'Amore. SAMSUNG-1003, ¶[114].

Additionally, the incorporation of Rao's prioritization techniques would have been nothing more than the implementation of software in a system already designed to execute similar program modules. SAMSUNG-1005, ¶¶[0033]-[0036], [0074]; SAMSUNG-1007, ¶¶[0092] (a "software set-up"). As Dr. Traynor explains, "the decision to implement Rao's prioritization techniques in Cole would have been an obvious design choice as a POSITA would have naturally experimented with additional known policies within the capability of Cole's processing capability, such as those described in Rao." SAMSUNG-1003, ¶[115].

In an example of the combined systems, illustrated below in Cole's Figure 2, Rao's packet capture mechanism and frame monitor would have been incorporated as program modules in the Cole and Cole-D'Amore devices, such that they would

monitor and identify data packets transmitted from the mobile device. SAMSUNG-1005, ¶¶[0034]-[0036], ¶¶[0074]-[0097], FIG. 2; SAMSUNG-1006, ¶¶[0049]-[0060], FIG. 2; SAMSUNG-1007, ¶[0109], ¶¶[0158]-[0159], ¶[0176], ¶[0180], ¶[0185], ¶[0191], FIG. 5A. In the combined Cole-D'Amore-Rao system, the packet capture mechanism and frame monitor would have aided the connection manager to classify and associate activities to applications, thus allowing the connection manager to make more informed deferral and scheduling decisions. SAMSUNG-1005, ¶¶[0034]-[0036], [0074]-[0097], FIG. 2; SAMSUNG-1006, ¶¶[0049]-[0060], FIG. 2; SAMSUNG-1007, ¶[0109], ¶¶[0158]-[0159], ¶[0176], ¶[0180], ¶[0185], ¶[0191], FIG. 5A. Additionally, Rao's prioritization techniques would have been used to further enhance the policy management module of the Cole-D'Amore device to allow the connection manager to make more effective prioritization decisions by monitoring additional application characteristics, for example, whether the application is running in the foreground or background. SAMSUNG-1005, ¶¶[0034]-[0036], [0074]-[0097], FIG. 2; SAMSUNG-1006, ¶¶[0049]-[0060], FIG. 2; SAMSUNG-1007, ¶[0109], ¶¶[0158]-[0159], ¶[0176], ¶[0180], ¶[0185], ¶[0191], FIG. 5A. In doing so, the Cole or Cole-D'Amore-Rao devices would have been able to more effectively use available network connections by preferentially scheduling higher priority application tasks during times of network availability (one of the main objectives of Cole). SAMSUNG-1005,

¶¶[0006]-[0011], ¶¶[0074]-[0075]; SAMSUNG-1003, ¶[115].



SAMSUNG-1005, FIG. 2 (modified based on D'Amore and Rao)⁶.

3. Analysis

[9]

Cole describes the connection manager 260, executed by the processor, as “*monitoring* the load on an active connection” and that some applications “require *user interaction.*” SAMSUNG-1005, ¶[0009], ¶[0074]. Additionally, Cole provides several examples where the user “[*interacts*] with the device” to effectuate a

⁶ In the combination of Cole and Rao, the “additional prioritization techniques” of Rao would directly interface with Cole’s memory 205 or storage 210.

“service usage control policy.” SAMSUNG-1001, 12:58-67, 13:1-21; SAMSUNG-1005, ¶¶[0074]-[0075], ¶¶[0088]-[0089]. For example, Cole describes that “a user ... selects a file for download” and that the file “is taking a long time to transfer.” SAMSUNG-1005, ¶[0088]. Cole describes that “the user opts to be reminded to download the web file later” (**“user interaction with the device”** to implement a **“service usage control policy”**). SAMSUNG-1005, ¶[0088]. Then, “the user returns home, [and] connects the mobile device 110 to a power source, ... the connection manager 260 [then] reminds the user to download the file.” SAMSUNG-1005, ¶[0088]; SAMSUNG-1003, ¶[116]. An example process where **“user interaction”** is considered by Cole in deferring network service usage activities is provided below.

Additionally, Rao describes “foreground” applications that are “in active use by the user (**“user interaction”**).” SAMSUNG-1007, ¶[0003]. Also, Rao describes “prioritization based on whether an application is running in the foreground or the background” (**“select different service usage control policies based at least in part on ... monitoring of user interaction with the device”**). SAMSUNG-1007, ¶[0182]. Indeed, Rao describes that it can “determine whether the application ... associated with the network packet is running in the foreground or the background” (**“user interaction with the device”**). SAMSUNG-1007, ¶¶[0188]-[0189]. Rao also includes a “packet capture mechanism” that “intercept[s] (**“monitor[s]”**)

... network traffic ... such as network packets associated with [an] application”

and a “frame monitor” that “identifies an application ... that generated the packet”

(an application is running in the foreground or the background). SAMSUNG-

1007, ¶[0109], ¶¶[0158]-[0159], ¶[0176], ¶[0180], ¶[0185], ¶[0191], FIG. 5A;

SAMSUNG-1003, ¶[117]; *see supra* §III.A.4.

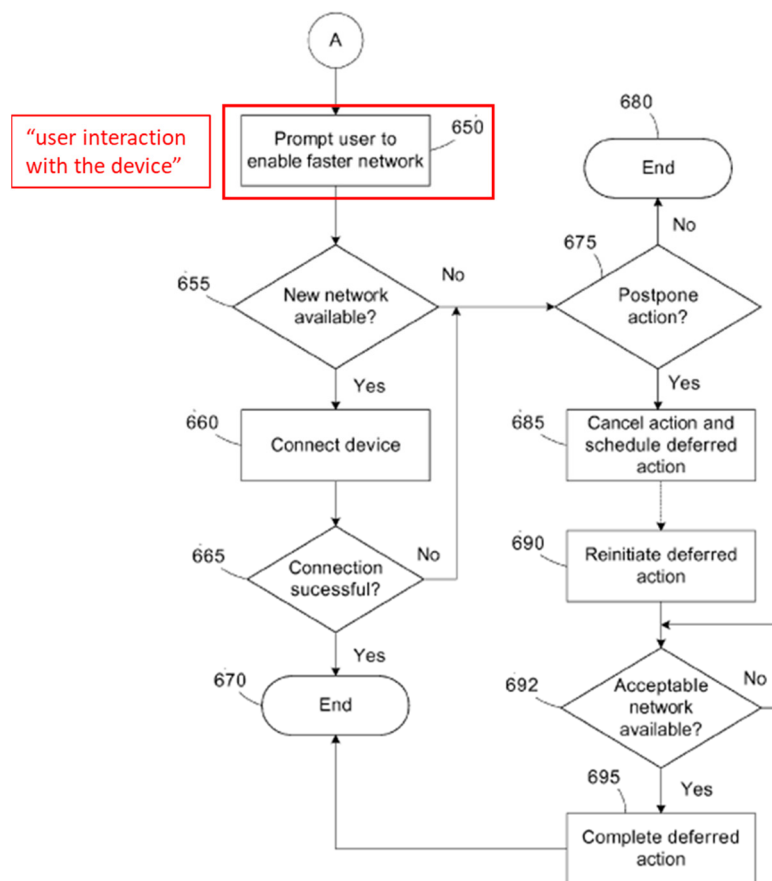


Figure 6B

SAMSUNG-1005, FIG. 6B.

Moreover, Dr. Traynor explains that “a POSITA would have interpreted

‘user interaction,’ with respect to the entire *‘device,’* broadly in the absence of any limiting description in the ’773 Patent, and therefore, there are other examples of *“user interaction with the device”* present within Cole, D’Amore, and Rao.”

SAMSUNG-1005, ¶[0041], ¶¶[0049]-[0053], ¶[0067], ¶[0074], ¶¶[0079]-[0080], ¶¶[0085]-[0089], ¶[0099], ¶[0123]; SAMSUNG-1006, ¶¶[0063]-[0069], ¶[0075]; SAMSUNG-1007, ¶[0003], ¶[0182], ¶¶[0188]-[0189]; SAMSUNG-1003, ¶[118].

As Dr. Traynor explains, in combining Rao with Cole or Cole-D’Amore, a POSITA would have recognized or found obvious that Rao’s capability to “determine” (*“monitor”*) if an application is in the “foreground” and “in active use by the user” would further benefit the connection manager in improving the “efficiency of the user” by considering if the application is in use when making a deferral or re-scheduling decision. SAMSUNG-1005, ¶[0074]; SAMSUNG-1007, ¶[0003], ¶[0182], ¶¶[0188]-[0189]; SAMSUNG-1003, ¶[119].

As Dr. Traynor explains, a POSITA would have recognized or found obvious that the connection manager’s consideration of *“user interaction”* would have been *“in addition to the current WWAN network busy state”* as Rao describes that there are a “multitude of ways to define client-side application priorities” (to include “congestion” (*“busy state”*)). SAMSUNG-1007, ¶[0182], ¶[0195]; SAMSUNG-1003, ¶[120].

[11]

Cole describes that application programs (“*a plurality of applications*”) can interact with and schedule a task with the scheduler (which “[*receives*] the *requests*” and “[*allows*] *applications to request a time slot demand for a background network service usage activity*”). SAMSUNG-1005, ¶[0126]; SAMSUNG-1003, ¶[121]; *see supra* [1.4].

As Dr. Traynor explains “the use of an ‘*Application Programming Interface (API)*’ to communicate between program modules (e.g., the scheduler “*receiving ... requests through an operating system device service access [API]*” from applications) would have been a design choice for a POSITA, and a choice that they would have understood and found obvious.” SAMSUNG-1003, ¶[122]. Indeed, Rao discloses several examples where “*APIs*” are used to facilitate communications between program modules. SAMSUNG-1007, ¶[0106] (the “agent” and “filter”), ¶[0110], (the “packet capture mechanism” and application “packets”), ¶[0205] (the “agent” and the “network stack”), *see also* ¶[0166], ¶[0190]. Additionally, Kalibjian, a U.S. Patent directed to a “policy based cryptographic *application programming interface* in secure memory” corroborates the use of “*APIs*” to communicate between program modules in mobile devices before the Critical Date, and describes “[the] *API*, for example, provides calling conventions for the

application program to access the operating system and other services.” SAM-SUNG-1019, Cover, 1:10-13, *see also* 2:3-17, 3:14-32; SAMSUNG-1003, ¶[122].

[12]

Recall from [11] that the use of APIs was well known in the art as of the Critical Date. *See supra*, [11]. Rao describes that its policies can specify the “size of the payload of the network packet” (“*data size*”). SAMSUNG-1007, ¶[0182]. As Dr. Traynor explains, in implementing the Cole-Rao and Cole-D’Amore-Rao combinations, a POSITA would have recognized or found obvious that applications would communicate the “size of the payload” (“*data size*”) of their network service usage activity to the scheduler when “scheduling a task” as this information would affect network and power state prerequisites. SAMSUNG-1005, ¶¶[0119]-[0126]; SAMSUNG-1007, ¶[0182]; SAMSUNG-1003, ¶[123]; *see supra* [11]. In this regard, a POSITA would have found it obvious to implement the policies of the connection manager 260 and/or scheduler 229 as dependent on the data size of the activity. *Id.* For example, Cole describes that there is concern that updates performed while operating on battery power or charging would result in “long completion time, draining the battery, or lengthening the charge time.” SAM-SUNG-1005, ¶[0124]. In incorporating the policies of Rao, the connection manger 260 and/or scheduler 229 would have had access to information on the data size of

the activity which they would have used to judge the potential for these adverse effects when evaluating if connectivity and power state prerequisites are met. SAMSUNG-1005, ¶¶[0119]-[0126]; SAMSUNG-1007, ¶[0182]; SAMSUNG-1003, ¶[123].

[16]

Rao describes that “network packets may be further prioritized by the characteristic of the application ... generating them.” SAMSUNG-1007, ¶¶[0193]-[0195]; SAMSUNG-1003, ¶[125]. For example, Rao describes that its remote access client can “recognize a high number of retransmits to a particular destination” (“*service usage behavior*”) and, in response, “throttle back or not communicate network packets” (“*apply the current service usage control policy for one or more of the background network service activities based on a service usage behavior analysis of the activity*”). SAMSUNG-1001, 103:6-33 (“frequent transmission”); SAMSUNG-1007, ¶[0195]; SAMSUNG-1003, ¶¶[124]-[125].

As Dr. Traynor explains, a POSITA would have also understood “*service usage behavior*” to include other application characteristics described in Cole, D’Amore, and Rao. SAMSUNG-1003, ¶[126]. For example, Cole describes that the connection manager can “[identify] load on the WWAN modem 230” caused by large activities such as a “file for download” that causes a “lengthy transfer” (a “*service usage behavior*”). SAMSUNG-1005, ¶[0088]; SAMSUNG-1003, ¶[126].

[18]

Recall above that the Cole-Rao and Cole-D'Amore-Rao device considers “*user interaction*” when selecting a “*current service usage control policy*.” See *supra* [9]. As Dr. Traynor explains, because the Cole-Rao and Cole-D'Amore-Rao mobile device “*select[s] different service usage control policies based at least in part on ... user interaction with the device*,” a POSITA would have recognized or found obvious that it also “*appl[ies] the current service usage control policy for one or more of the background network service usage activities based on monitoring user interaction with the activity*” as this is consistent with the examples described above. SAMSUNG-1003, ¶[127]; see *supra* [9].

[19]

Recall from [11] that the use of APIs was well known in the art as of the Critical Date. See *supra*, [11]. Cole describes that “application programs ... interact with the scheduler 229 to schedule an update.” SAMSUNG-1005, ¶[0126]. Additionally, the connection manager 260, executed by the processor, is “configured to block such updates unless the defined prerequisites are met.” SAMSUNG-1005, ¶[0125]. As Dr. Traynor explains, for multiple reasons, a POSITA would have recognized or found obvious that, when the connection manager blocks an update (“*one or more policies applied to background network service usage activ-*

ities associated with that application”), it would leverage the application-scheduler interact[ion] to “[*inform*] each such application of [*the*] one or more policies.” SAMSUNG-1003, ¶[128].

First, a POSITA would have recognized that, without being informed of the “*one or more policies*” when blocking the update, the application would continue attempting to execute the update, thus leading to negative effects. SAMSUNG-1005-[0124]; SAMSUNG-1003, ¶[129].

Second, Cole describes that a network service usage activity can be “skipped and retried at its next scheduled time if the connectivity prerequisites are present at that subsequent time.” SAMSUNG-1005, [0123]. As Dr. Traynor explains, the scheduler would need to “[*inform*] each such application of [*the*] one or more policies” when execution of a network service usage activity is skipped and retried at a subsequent time, as the application would need to know when to reattempt execution. SAMSUNG-1005, [0123]; SAMSUNG-1003, ¶[130]; *see supra* [6], [20].

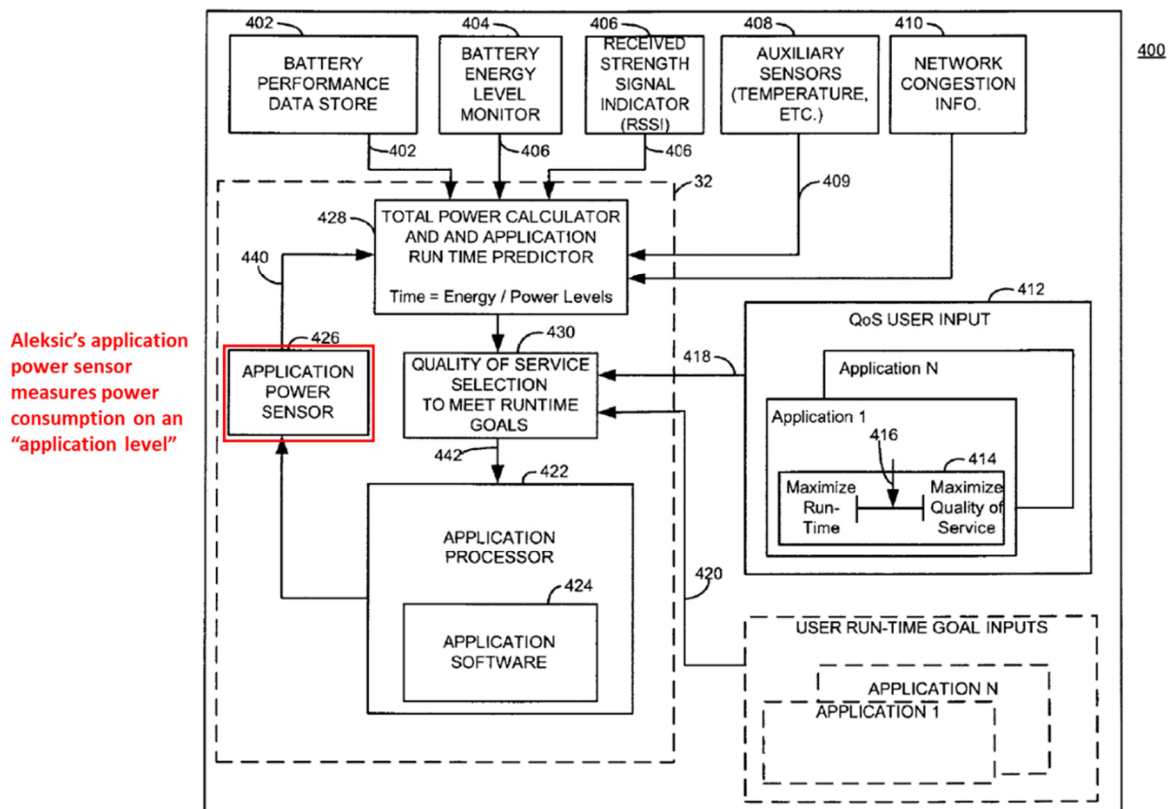
C. [GROUNDS 1E AND 1F] – Claim 17 is rendered obvious by Cole and Aleksic [1E], and/or Cole, D’Amore, and Aleksic [1F]

1. Overview of Aleksic

Aleksic describes “a controller that is responsive to a remaining power capacity of [a] battery” in a “portable device.” SAMSUNG-1011, Abstract. The controller “provides power for a higher priority feature at the expense of a lower

priority functional processing capability feature.” SAMSUNG-1011, Abstract.

Aleksic describes that these “features” can be “software applications.” SAMSUNG-1011, ¶[0003], ¶[0028], ¶[0033], FIG. 10, FIG. 13. Aleksic’s controller includes an “application power sensor” that can “determine how much power is being consumed when executing [an] application.” SAMSUNG-1011, ¶[0035]-[0038]; SAMSUNG-1003, ¶[131].



SAMSUNG-1011, FIG. 4.

2. Combination of Cole/Cole-D'Amore and Aleksic

It would have been obvious to a POSITA to modify Cole and the Cole-

D’Amore combination based on the teachings of Aleksic such that Aleksic’s application sensors would enhance the existing battery monitoring of Cole’s connection manager, such that the connection manager would determine “how much power is being consumed when executing [an] application.” SAMSUNG-1005, ¶¶[0034]-[0036], [0074]-[0100], FIG. 2; SAMSUNG-1011, ¶¶[0035]-[0038], FIG. 4; SAMSUNG-1003, ¶[132]. A POSITA would have been motivated to combine the teachings of Aleksic into Cole and Cole-D’Amore because Aleksic’s “application level power management system 400” would allow the these devices to determine at the application level, “how much power is being consumed when executing [an] application,” which would further enhance the ability of the connection manager to make deferral and rescheduling decisions based on “power state of the mobile device.” SAMSUNG-1005, ¶¶[0088]-[0100]; SAMSUNG-1011, ¶¶[0035]-[0038]; SAMSUNG-1003, ¶[132]; *see supra* [1.4]-[1.7]. As Dr. Traynor explains, incorporating application level power consumption monitoring into the Cole and Cole-D’Amore devices would also allow application power consumption behavior analysis that the connection manager would use to identify power-intensive applications and activities. *Id.*; SAMSUNG-1003, ¶[132].

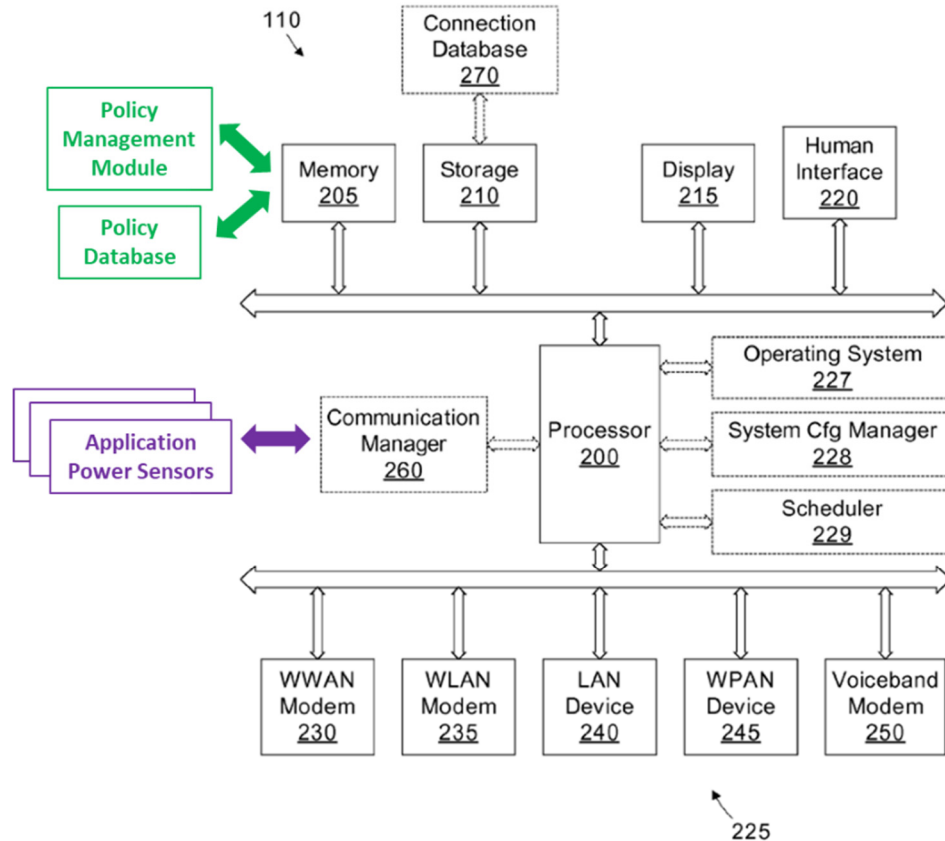
As explained below, combining Cole and the Cole-D’Amore combination with Aleksic would have involved (1) combining prior art elements according to

known methods to yield predictable results; and (2) use of known techniques to improve similar devices (methods, or products) in the same way. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007); *MPEP* 2143; SAMSUNG-1003, ¶[133].

Incorporating Aleksic's application power sensors as program modules into Cole and the Cole-D'Amore mobile device would have been predictable and foreseeable with a reasonable expectation of success because Cole describes that the operating system 227 "monitors and predicts battery life" and that the connection manager "interfaces with the operating system 227 to identify the current operating mode and power state." SAMSUNG-1005, ¶¶[0088]-[0100]; SAMSUNG-1011, ¶¶[0035]-[0038], ¶[0041], FIG. 4, FIG. 5; SAMSUNG-1003, ¶[134]. Like Cole and D'Amore, Aleksic describes that its techniques can be implemented in mobile devices (a "portable device"). SAMSUNG-1005, ¶¶[0014]-[0015], SAMSUNG-1006, ¶¶[0007]-[0016]; SAMSUNG-1011, Abstract, ¶[0022]; SAMSUNG-1003, ¶[134].

In an example of the combined system, illustrated below in Cole's Figure 2, Aleksic's application power sensors would further enhance the ability of the Cole and Cole-D'Amore connection manager to respond to undesirable battery consumption associated with certain application activities, such that more accurate deferral and rescheduling decisions would be made regarding power consumption.

SAMSUNG-1005, ¶¶[0034]-[0036], [0074]-[0100], FIG. 2; SAMSUNG-1011, ¶¶[0035]-[0038], FIG. 4; SAMSUNG-1003, ¶[135]. For example, when starting a known power-intensive application, the connection manager would be able to expediently identify, based on past monitoring of that application, that device power level did not support the application's activity, and as a result, recommend deferral or rescheduling. *Id.* In doing so, the Cole-Aleksic and Cole-D'Amore-Aleksic devices would have been able to more effectively utilize device battery power (one of the purposes of Cole's connection manager) by identifying application activities that have excessive power consumption. SAMSUNG-1005, ¶¶[0090]-[0100]; SAMSUNG-1003, ¶[135].



SAMSUNG-1005, FIG. 2 (modified based on the Cole-D'Amore-Aleksic combination)⁷.

3. Analysis

[17]

Aleksic describes an “**application level** power management system 400” that includes an “application power sensor” that can “determine how much power

⁷ Cole-Aleksic would have been implemented in a similar manner, such that the “application power sensors” interface with the “communication manager 260.”

is being consumed when executing [an] application” (“***monitoring power consumption behavior of the activity***”). SAMSUNG-1011, ¶¶[0035]-[0038]. Aleksic describes monitoring this information for “controlling, at an application level, operation of an application ... based on a determined signal strength and battery capacity level” (“***apply the current service usage control policy for one or more of the background network service usage activities***”). SAMSUNG-1011, ¶[0028]; SAMSUNG-1003, ¶[136]. In incorporating Aleksic into the Cole or the Cole-D’Amore combination, the deferral and rescheduling decisions of the connection manager would be further enhanced by Aleksic’s “application level” measurement of power consumption. SAMSUNG-1005, ¶¶[0088]-[0100]; SAMSUNG-1011, ¶¶[0028], [0035]-[0038]; SAMSUNG-1003, ¶[136].

Indeed, Cole describes that the connection manager can identify and defer application activities that consume significant battery power (“the lengthy transfer is conducted using the WWAN modem 230 (e.g., a 3G channel), which consumes significant battery power”). SAMSUNG-1005, ¶¶[0088]-[0100]. In implementing the Cole-Aleksic and Cole-D’Amore-Aleksic combinations, application power sensors would assist the connection manager in making deferral decisions based on monitoring power consumption “at the application level” (“***apply the current service usage control policy for one or more of the background network service usage activities based on monitoring power consumption behavior of the activity***”).

SAMSUNG-1005, ¶¶[0088]-[0100]; SAMSUNG-1011, ¶¶[0028], [0035]-[0038];
SAMSUNG-1003, ¶[137].

IV. PTAB DISCRETION SHOULD NOT PRECLUDE INSTITUTION

A. *Discretionary Denial under 325(d) is not warranted*

The Examiner did not issue a prior art rejection in the prosecution of the '773 patent. *See, generally*, SAMSUNG-1002. There is no indication in the '773 Patent's file history that the Examiner substantively considered any of the prior art applied in this Petition prior to allowing the application that issued as the '773 Patent. *Id.*

While a family member of Cole (a U.S. Pat. Pub. No. 2008/0080457 ("Cole-2")) was cited on an IDS by the applicant, this application was not cited by the Examiner and there is no evidence that this reference was substantively considered by the Office. *Id.*, 179, 462. Additionally, in the prosecution history of U.S. Patent No. 9,277,445 (a family member of the '773 Patent), the Examiner in that case did not rely upon Cole-2 to formulate a prior art rejection or map to any feature similar to the claims at issue in this Petition. Instead, the Examiner merely simply stated that Cole-2 "show[s] the connection manager [is] responsive to power state." SAMSUNG-1013, 478-489.

Additionally, while a family member of Rao (PCT application WO 2006/012610A2 ("Rao-2")) was cited on an IDS by the applicant, this application

was not cited by the Examiner and there is no evidence that this reference was substantively considered by the Office. SAMSUNG-1002, 203.

Because the '773 Patent's prosecution did not involve any discussion between the applicant and the Examiner regarding the teachings of the prior art applied in this Petition, the invalidity challenge based on the prior art asserted in this Petition is not the same as, or substantially similar to, art and arguments previously presented to the Office in connection with the '773 Patent. *See, generally*, SAMSUNG-1002. Moreover, even if any of these references were somehow considered to be cumulative, the prosecution history never examined any of the claims in view of the asserted combinations of prior art references applied in this petition. Accordingly, neither condition of the first prong of the *Advanced Bionics* framework is met, and there is no need to reach the second prong to resolve against discretionary denial under Section 325(d). *See, e.g., Oticon Medical AB et. al. v. Cochlear Ltd.*, IPR2019-00975, Paper 15 at 20 (PTAB Oct. 16, 2019) (precedential).

As demonstrated in this Petition and with reference to Dr. Traynor's testimony, the Examiner's failure to consider obviousness of the Challenged Claims over the uncited references asserted in this Petition constitutes material error.

B. 35 U.S.C. §314(a) – Discretionary Denial is not Merited in view of Petitioner's *Sotera* Stipulation

In *Apple Inc. v. Fintiv, Inc.*, the Board enumerated six factors to determine whether a petition should be discretionarily denied institution under §314(a).

IPR2020-00019, Paper 11 at 2-3 (PTAB “precedential” Mar. 20, 2020) (“*Fintiv*”).

In June 2022, the USPTO issued updated discretionary denial guidance in view of the *Fintiv* factors and expressly noted that ***the PTAB will not discretionarily deny institution if Petitioner presents a Sotera stipulation.*** SAMSUNG-1015, 3, 7-8.

Here, Petitioner has eliminated any risk of duplicated effort by voluntarily presenting a *Sotera* stipulation to Patent Owner. SAMSUNG-1016; *Sotera Wireless, Inc. v. Masimo Corp.*, Case IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020). For at least this reason, the Board should not discretionarily deny this petition.

Although the Board need not address additional *Fintiv* factor considerations in light of Samsung’s *Sotera* stipulation, indeed, the *Fintiv* factors do not favor denial.

Factor 1 is neutral because neither party has requested a stay in co-pending litigation.

Factor 2 is neutral because the Court’s trial date is speculative at this point and subject to change. The Board will likely issue its Final Written Decision around February 2025, approximately six months after the currently scheduled trial date (August 5, 2024). . SAMSUNG-1017, 1. However, as the Board and Director have previously recognized, “scheduled trial dates are unreliable and often change.” SAMSUNG-1015, 8.

Factor 3 also favors institution because Petitioner has diligently filed this

Petition months ahead of the one-year time bar, while the EDTX Litigation is still in its early stages. Beyond exchanging preliminary infringement/invalidity contentions, the parties and the District Court have yet to expend significant resources on invalidity. SAMSUNG-1017, 5.

Factor 4 also favors institution because Petitioner has provided a *Sotera* stipulation. SAMSUNG-1016.

Factor 5: The parties in the parallel EDTX litigation are the same.

Factor 6 favors institution because the merits of this Petition are compelling, as described in this Petition.

V. CONCLUSION AND FEES

The Challenged Claims are unpatentable. Petitioner authorizes charge of fees to Deposit Account 06-1050.

VI. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung”) are the real parties-in-interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

The ’773 Patent is the subject of a civil action, *Headwater Research LLC v. Samsung Electronics Co., Ltd. et al.*, 2:22-cv-00467, E.D. Tex., filed December 6,

2022 (SAMSUNG-1004). Petitioner and Headwater are also involved in case nos. 2:22-cv-00422 and 2:23-cv-00103, also in EDTX.

Petitioner is not aware of any other disclaimers, reexamination certificates, or IPR petitions addressing the '773 Patent.

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel.

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D. Service Information

Please address all correspondence and service to the address listed above.

Petitioner consents to electronic service by email at IPR39843-0161IP1@fr.com

(referencing No. 39843-0161IP1 and cc'ing PTABInbound@fr.com, axf-ptab@fr.com, jjm@fr.com, and khan@fr.com).

Respectfully submitted,

Dated July 21, 2023

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Attorneys for Petitioner

CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 13,884 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated July 21, 2023

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Attorneys for Petitioner

CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on July 21, 2023, a complete and entire copy of this Petition for *Inter Partes* Review and all supporting exhibits were provided by Federal Express, to the Patent Owner, by serving the correspondence address of record as follows:

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