

United States Patent and Trademark Office
Before the Patent Trial and Appeal Board

***Samsung Electronics Co., Ltd., Samsung Electronics
America, Inc., and Google LLC***
(Petitioners)

V.

Headwater Research LLC
(Patent Owner)

Inter Partes Review

No. IPR2024-00341 | **U.S. Patent No. 8,406,733**

Petitioners' Demonstrative Exhibits

May 5, 2024

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE | 1

Grounds for Unpatentability

Pet., 1

US 8,406,733 B2

(12) United States Patent Raleigh		(10) Patent No.: US 8,406,733 B2	
		(45) Date of Patent: Mar. 26, 2013	
(54) AUTOMATED DEVICE PROVISIONING AND ACTIVATION	5,903,845 A	5/1999	Buhrmann et al.
	5,933,778 A	8/1999	Buhrmann et al.
(75) Inventor: Gregory G. Raleigh , Woodside, CA (US)	5,940,472 A	8/1999	Newman et al.
	6,038,452 A	3/2000	Strawczynski et al.
	6,047,268 A	4/2000	Bartoli et al.
(73) Assignee: Headwater Partners I LLC , Redwood Shores, CA (US)	(Continued)		
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.	FOREIGN PATENT DOCUMENTS		
	EP	1463238	9/2004
	EP	1739518	1/2007
	(Continued)		
(21) Appl. No.: 13/461,141	OTHER PUBLICATIONS		
(22) Filed: May 1, 2012			

EX-1001

Ground	Challenged Claim(s)	35 U.S.C. §103	
1	1-17, 19, 21-27, 29, 30	TS-23.140 and Ogawa	

Reference	Filing Date	Publication Date	Prior Art basis
TS-23.140	-	March 2005 (EX-1024 ¹)	102(b)
Ogawa	5/19/2008	10/1/2009	102(a)/102(e)

Pet., 1.

Independent Claim 1

Pet., ii-iii

1. An end-user device comprising:
a modem for enabling communication with a network system over a service control link provided by the network system over a wireless access network, the service control link secured by an encryption protocol and configured to support control-plane communications between the network system and a service control device link agent on the end-user device;
a plurality of device agents **communicatively coupled** to the service control device link agent **through an agent communication bus**, each of the plurality of device agents identifiable by an associated device agent identifier; and
memory configured to store an encryption key, the encryption key shared between the service control device link agent and a service control server link element of the network system;
wherein the service control device link agent is configured to:
receive, over the service control link, an encrypted agent message from the service control server link element,

using the encryption key, obtain a decrypted agent message, the decrypted agent message comprising a particular agent identifier and message content for delivery to a particular device agent of the plurality of device agents, the particular agent identifier identifying the particular device agent, the message content from a particular server of a plurality of servers communicatively coupled to the service control server link element, and
based on the particular agent identifier, deliver the message content to the particular device agent over the agent communication bus.

Petitioners' Two Arguments Re: "Agent Communication Bus" Term

Pet., 30-31

Petition

1

them[.]” EX-1004, 54. A POSITA would have understood that the MMS User Agent and other applications would interface “through an agent communication bus” as that term is used in the ’733 patent. EX-1003, ¶124 (explaining that the

Pet., 30.

2

Alternatively, a POSITA would have had reason to implement communications between the MMS User Agent and the device’s other applications to occur over a bus. EX-1003, ¶125. Before the Critical Date, it was well-known to use a

Pet., 30-31.

Petitioners' First Argument Re: "Agent Communication Bus" Term

Pet., 30-31

Petition

1

them[.]” EX-1004, 54. A POSITA would have understood that the MMS User Agent and other applications would interface “through an agent communication bus” as that term is used in the ’733 patent. EX-1003, ¶124 (explaining that the

Pet., 30.

2

Alternatively, a POSITA would have had reason to implement communications between the MMS User Agent and the device’s other applications to occur over a bus. EX-1003, ¶125. Before the Critical Date, it was well-known to use a

Pet., 30-31.

US 8,406,733 B2

In some embodiments of the agent communication bus 1630, the design of the agent communication bus depends on the nature of the design embodiments for the agents and/or other functions. For example, if the agents are implemented largely or entirely in software, then the agent communication bus can be implemented as an inter-process software communication bus. In some embodiments, such an inter-process software communication bus is a variant of D-bus (e.g., a message bus system for inter-process software communication that, for example, helps applications/agents to talk to one another), or another inter-process communication protocol or system, running a session bus in which all communications over the session bus can be secured, signed, encrypted or otherwise protected. For example, the session bus can be

In some embodiments, if the agents and other functions are designed with a mixture of software and hardware, or primarily with hardware, then the implementation of the bus design will vary, and the principles and embodiments described herein will enable one of ordinary skill in the art to design the specifics of the agent communication bus 1630 to meet a particular set of product and desired functional requirements.

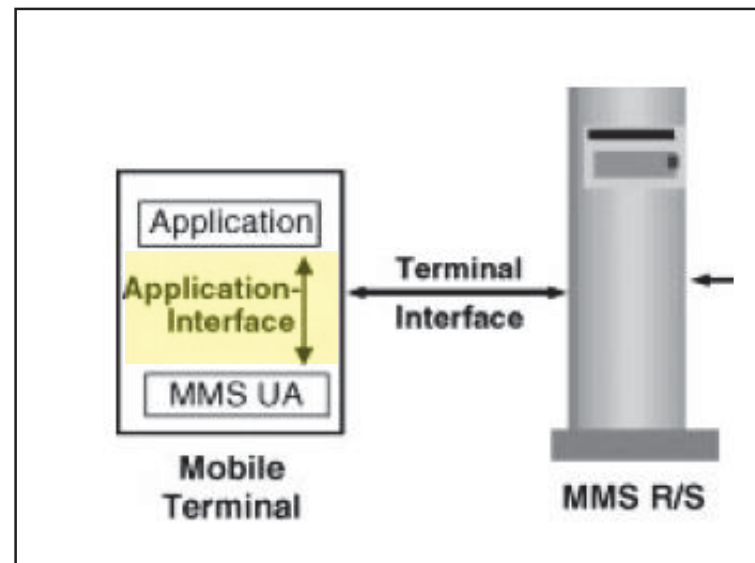
EX-1001, 42:48-61, 42:67-43:7

Computer Desktop Encyclopedia

software bus A programming interface that allows software modules to transfer data to each other. Although "bus" is traditionally a hardware term for an interconnecting pathway, it is occasionally used in this manner when the focus is on internally transferring large amounts of data from one process to another. See *bus*.

EX-1049, 907

Mostafa



EX-1028, 732 (FIG. 4, excerpted, annotated)

Petitioners' Analysis Re: "Agent Communication Bus" Term

Pet., 30

Declaration of Dr. Traynor

interface with them[.]” EX-1004, 54. A POSITA would have understood that the MMS User Agent and other applications would interface “through an agent communication bus” as that term is used in the '733 patent. Per the '733 Patent, the “agent communication bus” can be a communication link that facilitates communications with the device agents. EX-1001, 42:48-61; *see also* EX-1038, 24 (Patent Owner’s statement in infringement contentions submitted in litigation indicating that “an agent communication bus” is “e.g., communication path for various agents and functions to communicate over”). Consistent with the Patent’s

EX-1003, ¶ 124

Patent Owner's Litigation Position

As a further illustration, the service control device link agents on Samsung’s devices are coupled to various other device agents within the device by way of the Android operating system through an agent communication bus (e.g., communication path for various agents and functions to communicate over). That communication structure allows for intercommunication between agents in the device, and enables the service control device link agents to send messages to (and control) behavior of other components within the system. The communications bus connecting device agents to the service control device link agents need not be internal to the device, and the

EX-1038, 24

The MMS Standard Describes Multiple Agents on an End-User Device

Pet., 27-31

1b	<i>[the end-user device comprising:] a plurality of device agents communicatively coupled to the service control device link agent through an agent communication bus, each of the plurality of device agents identifiable by an associated device agent identifier; and</i>
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Pet., ii.

MMS Standard

MMS User Agent: application residing on a UE, an MS or an external device that performs MMS-specific operations on a user's behalf and/or on another application's behalf.

* * *

Application Data: Information / data specific to an application other than the MMS User Agent / VASP which is intended to be transported without alteration by using MMS. Application Data may be of any content type and format.

EX-1004, 14

The MMS User Agent may provide additional application layer functionalities such as: . . . transport of application data;

EX-1004, 19

7.1.18 Support for transporting Application Data . . . MMS may also be used to transport data specific to applications.

EX-1004, 54-55

A POSITA Would Have Understood MMS's Agents to Be Communicatively Coupled Through an Agent Communications Bus

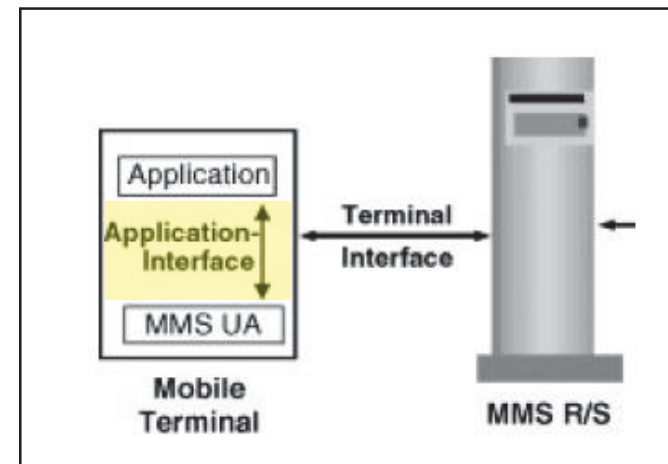
Pet., 29-30

Declaration of Dr. Traynor

interface with them[.]” EX-1004, 54. A POSITA would have understood that the MMS User Agent and other applications would interface “through an agent communication bus” as that term is used in the ’733 patent. Per the ’733 Patent, the “agent communication bus” can be a communication link that facilitates communications with the device agents. EX-1001, 42:48-61; *see also* EX-1038, 24 (Patent Owner’s statement in infringement contentions submitted in litigation indicating that “an agent communication bus” is “e.g., communication path for various agents and functions to communicate over”). Consistent with the Patent’s disclosure, and as commonly used in the field, busses facilitate inter-process communications between two pieces of software, such as two software applications. Similarly, a POSITA would have understood that there is a communication bus/link between user agent and the applications in TS-23.140 to facilitate communications of the application-specific messages between MMS User Agent and the destination applications.

EX-1003, ¶ 124

Mostafa



EX-1028, 732 (FIG. 4, excerpted, annotated)

Declaration of Dr. Brogioli

36. Despite the TS-23.140 specification making clear that how an MMS User Agent communicates with other applications is “outside the scope of this specification,” Dr. Traynor contends that “[a] POSITA would have understood that the MMS User Agent and other applications would interface ‘through an agent communication bus.’” Ex. 1003, ¶124.

37. I disagree with Dr. Traynor’s opinion in this regard, as a POSITA would know that an agent communication bus (such as, e.g., the D-Bus referenced in Dr. Traynor’s analysis) would be used to transfer data between *separate* applications. This is because buses in computing are typically used to route data *outside* of a given application, not *internal* to an application (e.g., to subparts or subapplications within that application). And each of the examples Dr. Traynor provides of a “bus” is for communications *external* to an application.

EX-2001, ¶¶ 36-37

Petitioners' Reply

III. HEADWATER'S NARROW INTERPRETATION OF "AGENT COMMUNICATION BUS" LACKS EVIDENTIARY SUPPORT AND IS REFUTED BY THE INTRINSIC AND EXTRINSIC RECORD

Reply, 4-10.

First, Headwater does not address (or dispute the Petition's characterization of) how the term "agent communication bus" is described in the '733 Patent, or even once cite to the relevant discussion of "agent communication bus" in the '733 Patent, or cite to any intrinsic evidence at all when discussing the term. *See* POR, 8-12. Nor does Headwater cite to any dictionary or other extrinsic evidence to support Dr. Brogioli's testimony regarding how "buses in computing" are "typically" used, let alone cite any evidence to support its narrow interpretation for "agent communication bus."

Reply, 6.

Petitioners’ Reply

example, the ’733 Patent uses the term “agent communication bus” to encompass a communication link that facilitates agent/application communications—e.g., between the service control device link agent and the device agents (Pet., 30; EX-1003, ¶124; EX-1001, 42:48-61)—*regardless of whether the communications are internal to an application or not.* The specification also explains that the ’733 Patent’s embodiments can be designed to use an “agent communication bus” to facilitate “inter-process” communications—i.e., communications between processes. EX-1001, 42:48-61 (cited at Pet., 30) (“[A]n inter-process software communication bus is a variant of D-bus (e.g., a message bus system for inter-process software communication that, for example, helps applications/agents to talk to one another”). Further, the patent uses “agent communication bus” broadly and expressly recognizes that the design of this bus can “vary,” “depend[ing]” on the “nature of the design embodiments for” agents/applications. *Id.*; *see also id.*, 42:67-43:7 (“[The implementation of the bus design will vary, and the principles

Reply, 8.

Petitioners' Reply

Moreover, Dr. Brogioli's purported testimony³ regarding the meaning of "agent communication bus" merely parrots the POR (POR, 7, 9) and lacks any evidentiary underpinning. EX-2001, ¶37. Such testimony is entitled to no weight because it provides no "additional supporting evidence" or "technical reasoning" to support Headwater's conclusion. *Xerox v. Bytemark*, IPR2022-00624, Paper 9, at 15 (Aug. 24, 2022) (precedential). Headwater's attempt to narrow "agent communication bus" fails for this reason alone, because it constitutes attorney argument that does not reflect the ordinary and customary meaning of the term as understood by a POSITA. 37 C.F.R. § 42.100(b).

Reply, 6-7.

XEROX v. BYTEMARK



Patent Trial and Appeal Board
PRECEDENTIAL
Designated: 2/10/2023

in a data record associated with that user's account." Dr. Jones does not cite to any additional supporting evidence or provide any technical reasoning to support his statement. Thus, the cited declaration testimony is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight. See 37 C.F.R. § 42.65(a) *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, at 15 (Aug. 24, 2022) (precedential)

Petitioners' Reply

³ The relevance of Dr. Brogioli's testimony to Headwater's position is tenuous at best. Dr. Brogioli fails to explain how "buses in computing" relate to (and/or differ from) an "agent communication bus"—which is the claimed term. He also notably does not rule out the use of "buses in computing" to facilitate communications to "subapplications" (or "subparts" of a software application). See EX-2001, ¶37. He only opines on how the term is "typically" used without rendering an opinion on whether buses were ever used for communications with subapplications. He avoids rendering such an opinion because, as discussed *infra* §§ III & IV.A, they *were* used for such communications.

Reply, 6-7 n.3.

Computer Desktop Encyclopedia

software bus A programming interface that allows software modules to transfer data to each other. Although “bus” is traditionally a hardware term for an interconnecting pathway, it is occasionally used in this manner when the focus is on internally transferring large amounts of data from one process to another. See *bus*.

EX-1049, 907

Savanyo

subsystems (block 58). This step maps out the space needed for each subsystem to communicate with a software bus. The software bus interconnects the control software’s subsystems. The software bus is a buffer or data structure through which all data transfers are passed. For instance, if a second subsystem needs certain predefined data from a first subsystem, the data is copied from a portion of the software bus used to hold the first subsystems’s outputs to a portion of the bus used as an input buffer to the second subsystem. The relinking step (block 58) also generates data

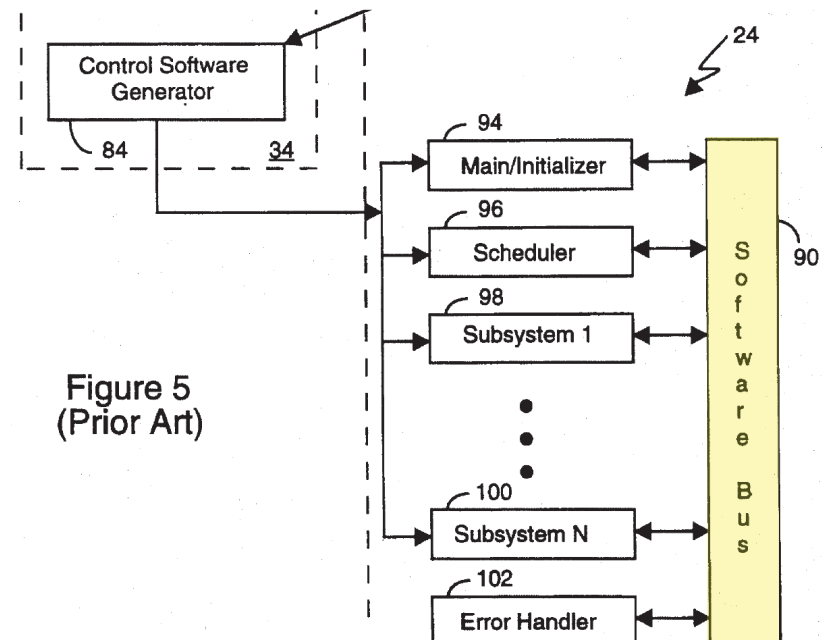


Figure 5
(Prior Art)

EX-1050, 2:64-3:6, FIG. 5 (excerpted, annotated)

Patent Owner's Sur-Reply

First, Petitioner alleges that the definition of "agent communication bus" does not itself *exclude* a bus used for intra-application communication. *See* Reply 4-10. However, this is a red herring, as Patent Owner has *never* argued that the claimed "agent communication bus" would, *by definition*, exclude anything used for intra-application communication bus. Instead, Patent Owner made clear that POSITAs did

Sur-Reply, 14-15.

Petition

1

them[.]” EX-1004, 54. A POSITA would have understood that the MMS User Agent and other applications would interface “through an agent communication bus” as that term is used in the ’733 patent. EX-1003, ¶124 (explaining that the

Pet., 30.

2

Alternatively, a POSITA **would have had reason to implement** communications between the MMS User Agent and the device’s other applications to occur over a bus. EX-1003, ¶125. Before the Critical Date, it was well-known to use a

Pet., 30-31.

Declaration of Dr. Traynor

to occur over a bus. Before the Critical Date, it was well-known to use a communications bus (e.g., a "D-bus") for inter-process communications that enable applications to interface with one another, as TS-23.140 describes. *See, e.g.,* EX-

¶28, FIG. 4. Using such a bus on the TS-23.140 device would have been a conventional, obvious way to implement what TS-23.140 describes. *Lee, for*

126. Thus, using a communications bus for inter-process communications that enable applications to interface with one another on the TS-23.140 device is nothing more than utilizing familiar, known components to achieve a predictable result of facilitating TS-23.140's user agent and other applications to interface with one another. A POSITA would have reasonably expected success doing so. *The*

EX-1003, ¶¶ 125-126

Well-Known to Use a Bus for Inter-Process Communications

Pet., 30-31;
Reply, 9-10

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In some embodiments of the agent communication bus 1630, the design of the agent communication bus depends on the nature of the design embodiments for the agents and/or other functions. For example, if the agents are implemented largely or entirely in software, then the agent communication bus can be implemented as an inter-process software communication bus. In some embodiments, such an inter-process software communication bus is a variant of D-bus (e.g., a message bus system) for inter-process software communication that, for example, helps applications/agents to talk to one another), or another inter-process communication protocol or

EX-1001, 42:48-61

Sathish

D-Bus communication stream to the provider. In this regard, the D-Bus may be an example of a device inter-process communication channel used to send information between applications. As such, method calls made over the D-Bus may be serialized as a message addressed to a particular application.

EX-1031, 10:56-62

Savanyo

The software bus interconnects the control software's subsystems. The software bus is a buffer or data structure through which all data transfers are passed. For instance, if

EX-1050, 2:64-3:6

Computer Desktop Encyclopedia

software bus A programming interface that allows software modules to transfer data to each other. Although "bus" is traditionally a hardware term for an interconnecting pathway, it is occasionally used in this manner when the focus is on internally transferring large amounts of data from one process to another. See bus.

EX-1049, 907

Patent Owner's Sur-Reply

- A. In TS-23.140, the destination applications are subapplications of the MMS User Agent..... 3
- B. Petitioner fails to establish the obviousness of using a bus for intra-application communication in the context of TS-23.140..... 12

Sur-Reply, i

Patent Owner's Sur-Reply

- A. In TS-23.140, the destination applications are subapplications of the MMS User Agent.....3
- B. Petitioner fails to establish the obviousness of using a bus for intra-application communication in the context of TS-23.140.....12

Sur-Reply, i

“An Application Other Than the MMS User Agent”

Pet., 6; Reply, 19-20

MMS Standard

3.1 Definitions

MMS User Agent: application residing on a UE, an MS or an external device that performs MMS-specific operations on a user's behalf and/or on another application's behalf.

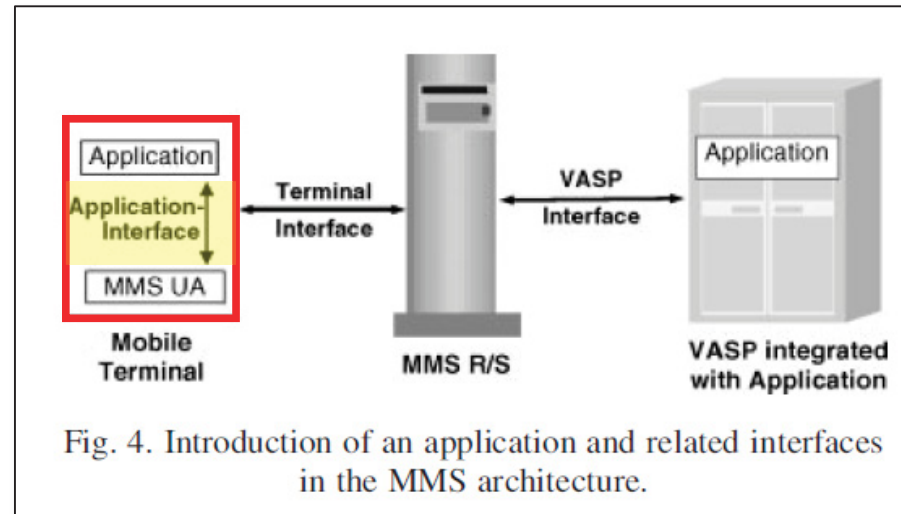
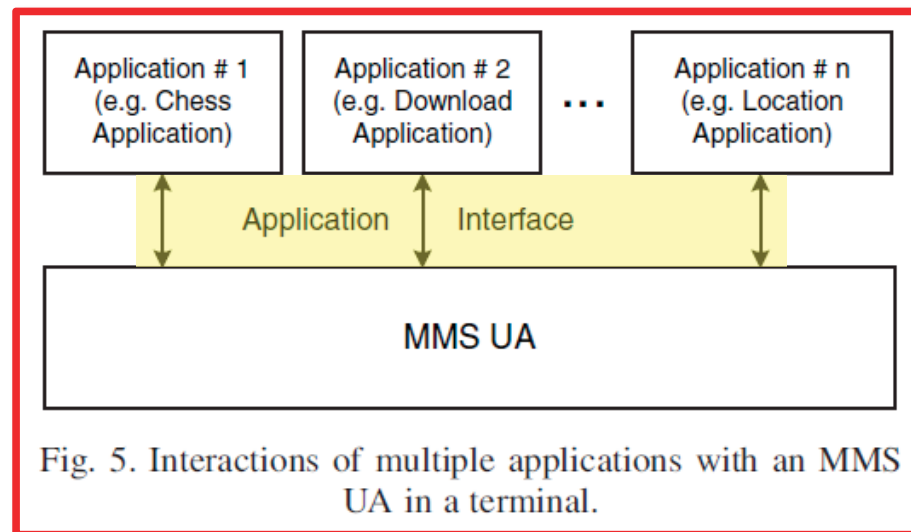
Application Data: Information / data specific to an application other than the MMS User Agent / VASP which is intended to be transported without alteration by using MMS. Application Data may be of any content type and format.

EX-1004, 14

7.1.18 Support for transporting Application Data

NOTE: Applications that want to transport data specific to applications other than MMS will initially need to register with the appropriate MMS User Agent or MMS VAS Application. During this registration process the application provisions an MMS User Agent or an MMS VAS Application with its application identification value and may negotiate with the MMS User Agent or MMS VAS Application the details (amount and format) of information to be exchanged between the two entities. The application registration process is outside the scope of this specification. The registration may be an inherent process e.g., in the application's integration into a mobile phone. It may also be the initial step after the download of a downloadable application to a mobile phone. Whatever the details of the application registration process are, an MMS User Agent or an MMS VAS Application acts according to the negotiated results from the application registration process.

EX-1004, 54



EX-1028, 732-733

Petitioners' Reply

The MMS User Agent application “performs *MMS-specific* operations on a user’s behalf and/or on another application’s behalf,” including using MMS to transport data to destination applications. EX-1004, 14, 19, 56. The destination application—e.g., a chess application (*id.*, 55) which “need[s] to register” in some way with the MMS User Agent application (*id.*, 54)—then performs its own distinct, *non-MMS* functions which TS-23.140 does not even describe. EX-1004, 56 (“The further handling and processing of the information by the destination application is *outside the scope of this specification*.”). Headwater’s implication that the MMS User Agent application and, e.g., a chess application, are the *same* application is simply wrong. Likewise, Headwater’s implication that TS-23.140 only contemplates the MMS User Agent application transporting application data to *itself* makes no sense.

Reply, 20

MMS Standard

7.1.18 Support for transporting Application Data

Apart from using MMS as a service for users to exchange messages, MMS may also be used to transport data specific to applications. Applications that intend to transport application specific data using MMS may either reside on an MMS User Agent or on an MMS VAS Application. Details of these applications or how an MMS User Agent or an MMS VAS Application would interface with them are outside the scope of this specification.

EX-1004, 54

Patent Owner's Response

B. In TS-23.140, the destination applications are subapplications of the broader MMS User Agent application.

As explained by Dr. Brogioli, a POSITA would understand that in TS-23.140, the destination applications are not external to the MMS User Agent, but instead "reside on [the] MMS User Agent." Ex. 2001, ¶¶38-48; Ex. 1004, 54 ("Applications that intend to transport application specific data using MMS may either reside on an MMS User Agent or on an MMS VAS Application.") (emphases added). Furthermore, a POSITA would have understood that for an application to "reside on an MMS User Agent" means that the application is a "subapplication" or "subpart" within the MMS User Agent application. Ex. 2001, ¶¶38, 45-48.

POR, 8

Patent Owner's Sur-Reply

according to Patent Owner, for an application to "reside on an MMS User Agent," it must reside on the MMS User Agent *application* (consistent with TS-23.140's explicit definition of "MMS User Agent"), such that the destination application is a sub-application of the MMS User Agent. POR at 1-2, 8-9.

Sur-Reply, 4

MMS Standard

7.1.18 Support for transporting Application Data

Apart from using MMS as a service for users to exchange messages, MMS may also be used to transport data specific to applications. Applications that intend to transport application specific data using MMS may either reside on an MMS User Agent or on an MMS VAS Application. Details of these applications or how an MMS User Agent or an MMS VAS Application would interface with them are outside the scope of this specification.

EX-1004, 54

Declaration of Dr. Traynor

51. “MMS may be used to transport data specific to applications” “other than the MMS User Agent.” *Id.*, 14, 54-56; *see also* EX-1028, pp. 732-733, section 2.2 (describing multiple applications residing on a user device terminal implemented to use MMS for messaging). The MMS User Agent and the destination applications “reside on [the] MMS User Agent [device],” which a POSITA would have understood to be the same as the UE in the context of this sentence because “MMS User Agent” was a term that was used also to refer to a client device. *See., e.g.,* EX-1028, p. 731 (“An MMS user agent (UA), also known as an *MMS client*, provides means for composing, sending, retrieving, viewing, and other controlling functions to users.”).

EX-1003, ¶ 51

In Some Contexts, MMS User Agent Referred to User Device

Reply, 21-23



MMS UA

MMS Standard

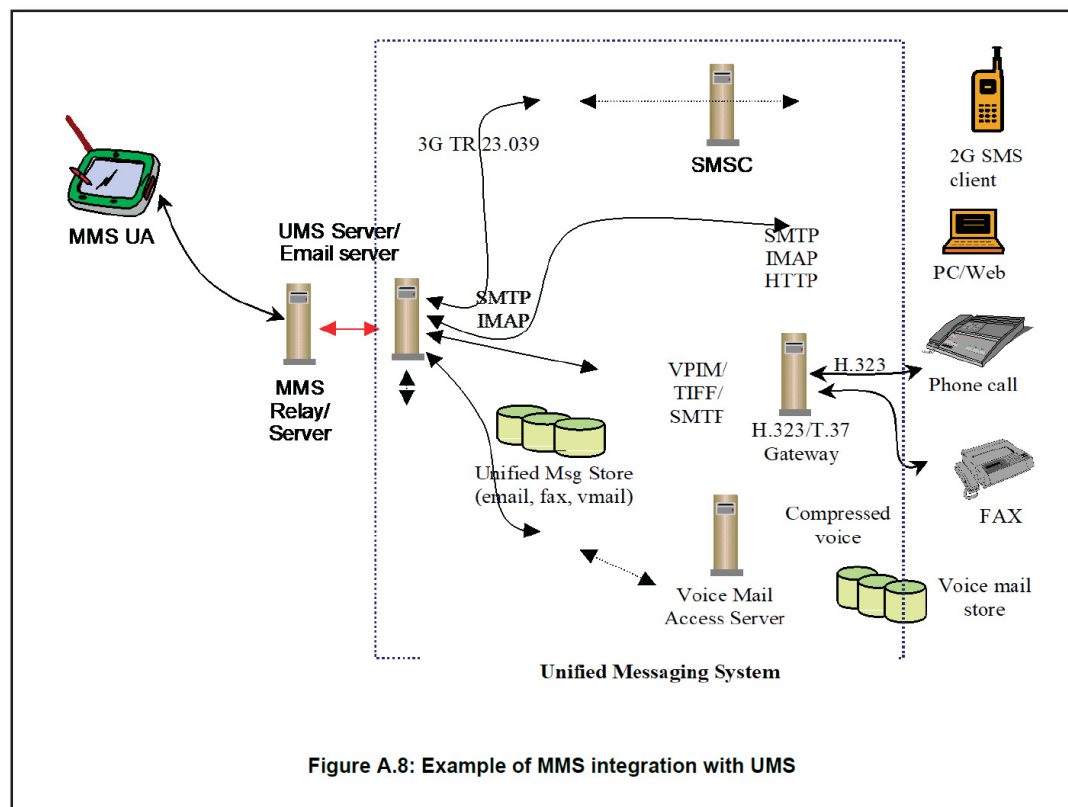


Figure A.8: Example of MMS integration with UMS

EX-1004, 160 (Figure A.8)

MMS Standard

Upon retrieval request the recipient MMS Relay/Server

shall store messages in the network until the recipient MMS User Agent becomes reachable (e.g. user moves back into coverage, switches MMS User Agent on) or until the or until the MM expires

EX-1004, 29



MMS UA

EX-1004, 160
(from Figure A.8)

Testimony of Dr. Brogioli

Q. When it says "user moves back into coverage," what's your understanding of what the word "coverage" means there?

A. That it's saying the -- the user agent is either, in one case, turned on or switched on or that it's within coverage, the user moves back within -- within network coverage so it's now reachable -- it sounds like reachable from the network or reachable from the MMS relay/server.

Q. That would be the user terminal being available or reachable over a network is what that "moves back into coverage" means?

A. I think that sounds fair, yeah. It reach -- I don't know that it's specifically saying -- I'll back up.

That's right. That it's now the user has moved back into an area where it's covered by the network and can be reached.

EX-1051, 51:21-53:6

Dr. Traynor's Testimony About MMS VAS Applications

POR, 8;
Sur-Reply, 5-6

Testimony of Dr. Traynor

Q. Okay. So what I'm specifically asking is the specification says that applications may reside on an MMS VAS application, and my specific question is what it means for an application to reside on the VAS application.

A. Sure. So again, this is just going to be some -- some feature or function. So this larger VAS application could have multiple subapplications, so it's -- we have some -- we have some service that's implemented on this server.

EX-2003, 29:16-30:11

Q. So are these applications then part of the MMS VAS application, if they reside on it?

I'm just trying to understand what "reside on" means in this context.

ATTORNEY JHURANI: Objection to form.

THE WITNESS: So I -- I could imagine an application -- a VAS application that's games. And let's say it's from the same company, one is checkers, one is chess, they could reside within a larger application or application framework and still have these subparts for specific games.

Testimony of Dr. Traynor

Q. Okay. And then it talks about application -- it also says, "Applications that intend to transport application-specific data using MMS may reside on an MMS user agent."

What does it mean for an application to reside on an MMS user agent?

A. So just one moment, please. I just want to find this because I talk about it in my report.

So can you go to paragraph 51 of my report, please?

Q. Yes. I'm there.

A. So what I point out here in -- in paragraph 51 is that the standard uses some language

interchangeably, and that is sometimes it uses the user agent to refer to the device, and sometimes it's being specific actually about the thing that is receiving the -- the MMS message.

Q. Okay. And in support of that statement you rely on Exhibit 1028, Mostafa, correct?

A. That is one thing that I cite to, but I also note that, again, as a person of ordinary skill in the art at the time, that these terms were often used interchangeably.

Q. Okay. So in this context an MMS user agent would essentially be referring to an MMS-capable UE?

THE WITNESS: So again, in this context I'm -- the context that I'm interpreting what you're saying is in the context of 7.1.18, and that is that it would be a UE that was capable of -- of processing MMS messages.

Again, sometimes this standard is more specific, it's talking about the thing that's actually doing the processing on the UE, but the terms are used imprecisely and interchangeably.

EX-2003, 30:13-31:22

Patent Owner's Sur-Reply

- A. In TS-23.140, the destination applications are subapplications of the MMS User Agent.....3
- B. Petitioner fails to establish the obviousness of using a bus for intra-application communication in the context of TS-23.140.....12

Sur-Reply, i

A Bus Provides a Communication Link Between Processes

Reply, 9-10

Petitioners' Reply

(2) a software bus simply provides a communication link or interface over which two processes (e.g., two agents within an application or two applications) communicate with each other, regardless of whether the processes are internal or external to an application.

Reply, 9-10

Computer Desktop Encyclopedia

software bus A programming interface that allows software modules to transfer data to each other. Although "bus" is traditionally a hardware term for an interconnecting pathway, it is occasionally used in this manner when the focus is on internally transferring large amounts of data from one process to another. See *bus*.

EX-1049, 907

An Application May Consist of More Than One Process

Reply, 9-10

IEEE Dictionary

application

(4) A software program consisting of one or more processes and supporting functions. (PE/SUB) 1379-1997

EX-1046, 46

Locasto

A software application can include multiple processes and/or threads that share resources. The software application may

EX-1047, 5:41-61

A Bus May Facilitate Intra-Application Communications

Reply, 9-10

Locasto

A software application can include multiple processes and/or threads that share resources. The software application may

EX-1047, 5:41-61

Kravitz

resources. Furthermore, processes that are either intra application or inter application may also share resources. Intra application processes refer to those that are within a same application; while inter application processes refer to those that belong to different applications. Resource sharing

EX-1048, ¶ 3

Savanyo

The software bus interconnects the control software's subsystems. The software bus is a buffer or data structure through which all data transfers are passed. For instance, if a second subsystem needs certain predefined data from a first subsystem, the data is copied from a portion of the software bus used to hold the first subsystem's outputs to a portion of the bus used as an input buffer to the second subsystem.

EX-1050, 2:64-3:6

The Petition's Reason to Implement

Sur-Reply, 12; Pet., 30-31

Patent Owner's Sur-Reply

In the Petition, Petitioner identified no affirmative reason why a POSITA would have implemented TS-23.140 messaging to destination applications as a “bus” other than that “it was well-known to use a communications bus (e.g., a ‘D-bus’) for inter-process communications that enable applications to interface with one another, as TS-23.140 describes,” and that doing so would have been simply using “familiar, known components to achieve a predictable result.” Pet. 30.

Sur-Reply, 12

Petition

over a bus. EX-1003, ¶125. Before the Critical Date, it was well-known to use a communications bus (e.g., a “D-bus”) for inter-process communications that enable applications to interface with one another, as TS-23.140 describes. EX-1003, ¶125 (citing EX-1031, 10:56-62; EX-1008, ¶28, FIG. 4). Using such a bus on the TS-23.140 device would have been a conventional, obvious way to implement what TS-23.140 describes, and is nothing more than utilizing familiar, known components to achieve a predictable result of facilitating TS-23.140’s user agent and other applications to interface with one another. KSR, 550 U.S. at 416; EX-1003, ¶125. A POSITA would have reasonably expected success doing so. EX-1003, ¶¶125-126. The end-user device in MMS-Ogawa thus has “a plurality of device

Pet., 30-31 (citing EX-1003, ¶¶ 125-126)

Dr. Brogioli's "Standard Function Calls" Argument

Sur-Reply, 12, 14

Declaration of Dr. Brogioli

application. A POSITA would have understood that, because the MMS User Agent *includes* each application to which it will deliver application-specific data, no agent communication bus would have been helpful or necessary. Instead, the MMS User Agent would provide data to its subcomponents via standard function calls, such as UpdateAppData(AppID, AppData), which would simply write the AppData to a memory location within the subapplication of the MMS User Agent identified by the AppID. Dr. Traynor presents no evidence that an "agent

EX-2001, ¶ 38

Patent Owner's Sur-Reply

¶¶38, 49. Dr. Brogioli also explicitly testified that "a POSITA would not have found it obvious to use an 'agent communication bus' for transporting data *within* an application such as the MMS User Agent," because simpler options that do not involve a bus are available and widely used for intra-application communication, and there would thus be no motivation to use a bus for this purpose. *Id.* ¶38.

application communication bus. Instead, Patent Owner made clear that POSITAs did not view the use of a bus as desirable for use in intra-application communications, such that the use of such a bus *would not have been obvious* to implement within the context of TS-23.140. POR at 9-11 ("It would not have been *obvious* for the

Sur-Reply, 12, 14

Petitioners' Reply

weight. *Xerox*, at 15. Moreover, there is no evidence whatsoever that the use of function/method “calls” and “buses” are mutually exclusive. Instead, the evidence of record establishes that *both* may be used together. *E.g.*, Sathish (EX-1031), 10:56-62 (cited at Pet., 30) (disclosing use of a “bus” as an “inter-process communication channel,” and “*method calls over the D-Bus*” that are “addressed to a particular application”); EX-1003, ¶125. Further still, and as explained above,

Reply, 14-15

Sathish

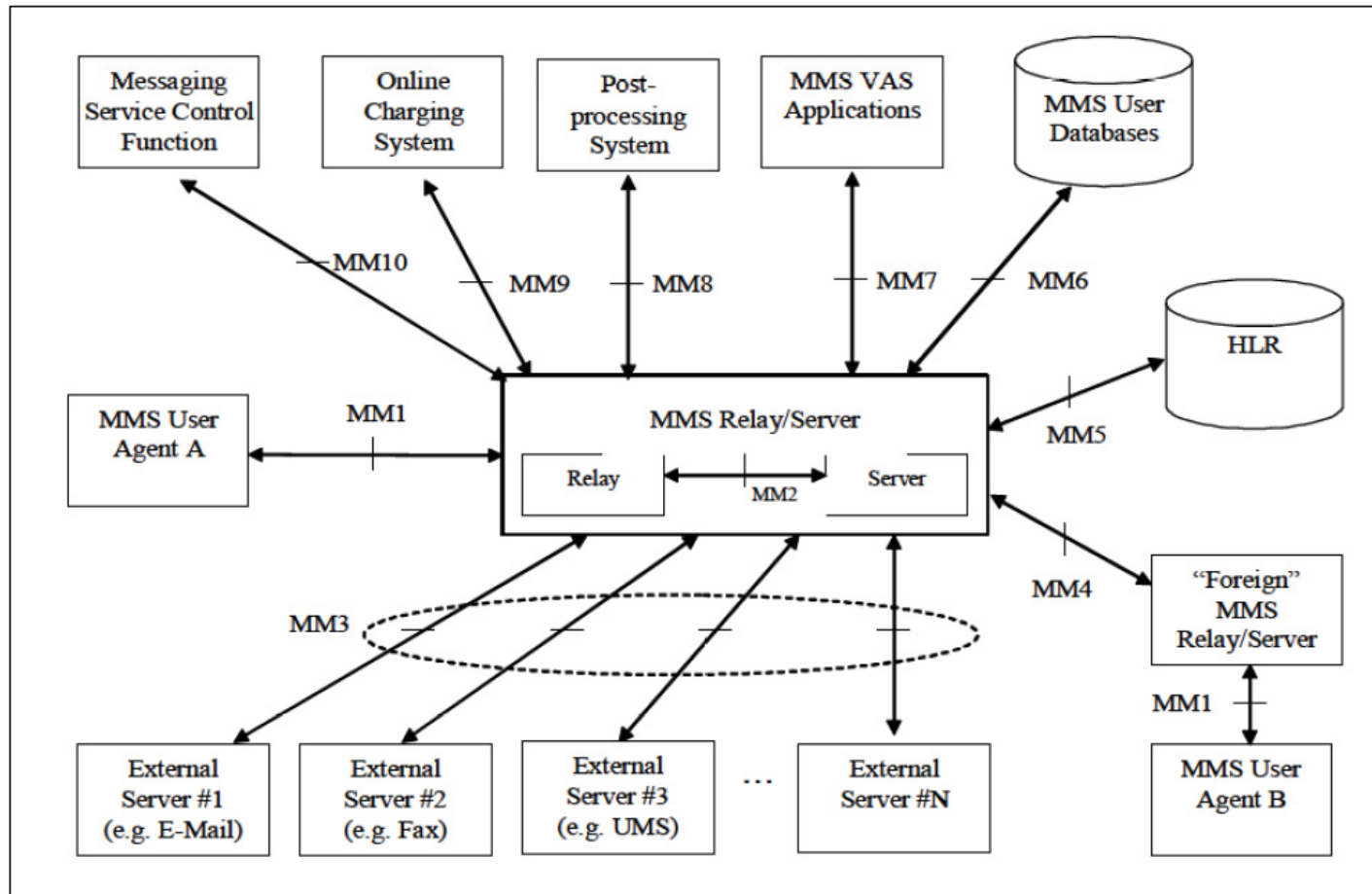
D-Bus communication stream to the provider. In this regard, the D-Bus may be an example of a device inter-process communication channel used to send information between applications. As such, *method calls made over the D-Bus* may be serialized as a message addressed to a particular application. The particular application may then listen and perform the service requested and place an output back on the D-Bus addressed to the browser application 100.

EX-1031, 10:56-62

MMS Implementation Environment

Pet., 5-6

MMS Standard



EX-1004, Fig. 3