

1
00:00:13,219 --> 00:00:18,689
hey guy thought we just give you a

2
00:00:15,959 --> 00:00:21,390
little video tour of our prototype just

3
00:00:18,689 --> 00:00:23,430
wanted to let you know this was built as

4
00:00:21,390 --> 00:00:26,579
a prototype this isn't how we would 100%

5
00:00:23,430 --> 00:00:31,500
build all once in the future this is in

6
00:00:26,579 --> 00:00:33,149
a modified sea-can it's 14 feet basic

7
00:00:31,500 --> 00:00:34,829
concept is fans and filters so we're

8
00:00:33,149 --> 00:00:36,360
just pulling air crews like you guys are

9
00:00:34,829 --> 00:00:39,600
doing in your servers using the same

10
00:00:36,360 --> 00:00:42,180
concept for fresh air cooling these are

11
00:00:39,600 --> 00:00:45,329
just louvered fans there are 6,000 CFM

12
00:00:42,180 --> 00:00:46,670
each these louvers are gravity we're

13
00:00:45,329 --> 00:00:49,100

trying to get it as cheap as possible

14

00:00:46,670 --> 00:00:53,940

we've used lures in the past that are

15

00:00:49,100 --> 00:00:55,559

that are motorized and controlled but if

16

00:00:53,940 --> 00:00:59,399

all that adds costs that could be an

17

00:00:55,559 --> 00:01:01,870

option that we could add this units 14

18

00:00:59,399 --> 00:01:04,119

like I said

19

00:01:01,870 --> 00:01:06,299

there that's what we're going to be

20

00:01:04,119 --> 00:01:08,650

building it in is 20 feet in the future

21

00:01:06,299 --> 00:01:12,040

gives us a little bit more airspace in

22

00:01:08,650 --> 00:01:14,950

the front and the back wraps and this

23

00:01:12,040 --> 00:01:17,950

side here is the intake air filter

24

00:01:14,950 --> 00:01:20,290

intake we went with very consumer level

25

00:01:17,950 --> 00:01:23,649

filters because one they're easy to find

26
00:01:20,290 --> 00:01:26,409
and to the chief so anyone can go to

27
00:01:23,649 --> 00:01:28,869
home hardware store and buy these

28
00:01:26,409 --> 00:01:30,940
filters there's 25 inch square filters

29
00:01:28,869 --> 00:01:35,259
then you can choose whatever filter

30
00:01:30,940 --> 00:01:37,090
level you want if you come in we built

31
00:01:35,259 --> 00:01:38,860
we built this all at a plywood and

32
00:01:37,090 --> 00:01:40,899
that's probably what we would use it's

33
00:01:38,860 --> 00:01:43,240
the easiest amount things it's it's

34
00:01:40,899 --> 00:01:45,520
cheap and it's fast and that's probably

35
00:01:43,240 --> 00:01:47,590
how we would do it in the future there'd

36
00:01:45,520 --> 00:01:48,970
be some more metal pieces inside but

37
00:01:47,590 --> 00:01:53,200
again like I said this is the prototype

38
00:01:48,970 --> 00:01:56,520

three racks this has 17 spondoolie that

39

00:01:53,200 --> 00:01:59,500

we bought from you guys the SP 31 s

40

00:01:56,520 --> 00:02:04,360

right now this has a maximum capacity of

41

00:01:59,500 --> 00:02:06,880

72 kW these are about 52 kW we might be

42

00:02:04,360 --> 00:02:08,649

able to get a few more in here once we

43

00:02:06,880 --> 00:02:10,539

balance all the power requirements out

44

00:02:08,649 --> 00:02:13,989

but we just didn't want to overdo that

45

00:02:10,539 --> 00:02:16,660

when we first started this units of 200

46

00:02:13,989 --> 00:02:19,209

out system again like I said 72

47

00:02:16,660 --> 00:02:22,090

kilowatts we can do a 400 out as well

48

00:02:19,209 --> 00:02:25,209

which is double that power and we think

49

00:02:22,090 --> 00:02:29,560

we can get 36 of your SP 35 s into that

50

00:02:25,209 --> 00:02:31,450

unit these are all spaced as you can see

51
00:02:29,560 --> 00:02:35,260
the whole concept is we're pulling air

52
00:02:31,450 --> 00:02:37,510
through as you know fairly rapidly we

53
00:02:35,260 --> 00:02:39,520
need some space in between so we can

54
00:02:37,510 --> 00:02:41,470
actually pull air through and across the

55
00:02:39,520 --> 00:02:43,060
server's so it comes in the front of the

56
00:02:41,470 --> 00:02:45,910
servers and past the server so we can

57
00:02:43,060 --> 00:02:47,140
pull air out the back and evacuate that

58
00:02:45,910 --> 00:02:51,250
heat because it's building up fairly

59
00:02:47,140 --> 00:02:55,540
quickly we've got in this unit we got

60
00:02:51,250 --> 00:02:57,340
you know switch we've got just a

61
00:02:55,540 --> 00:02:58,910
monitoring server here that does

62
00:02:57,340 --> 00:03:01,910
environmental and

63
00:02:58,910 --> 00:03:04,940

of your systems we're going a very basic

64

00:03:01,910 --> 00:03:08,330

very basic switches in this switches and

65

00:03:04,940 --> 00:03:09,590

BX again very chief the fans there's

66

00:03:08,330 --> 00:03:11,720

three of them they'll each be on a

67

00:03:09,590 --> 00:03:14,150

single breaker and each one of them will

68

00:03:11,720 --> 00:03:18,170

have a have a either on-off switch or a

69

00:03:14,150 --> 00:03:22,970

potentiometer to adjust speed again very

70

00:03:18,170 --> 00:03:25,460

for the most basic model and a couple

71

00:03:22,970 --> 00:03:27,620

convenience plugs that's all we have

72

00:03:25,460 --> 00:03:28,670

it's it's a very basic setup it works

73

00:03:27,620 --> 00:03:31,550

really well we've been running it now

74

00:03:28,670 --> 00:03:34,400

for a while we managed to run it on two

75

00:03:31,550 --> 00:03:36,230

fans we've run it in warm temperature we

76
00:03:34,400 --> 00:03:39,140
grind it fairly cold temperature we've

77
00:03:36,230 --> 00:03:41,240
been down near zero and it runs quite a

78
00:03:39,140 --> 00:03:44,240
bit better obviously when it's colder

79
00:03:41,240 --> 00:03:46,460
and as long as this units in ambient

80
00:03:44,240 --> 00:03:48,350
temperature of 30 degrees or less we

81
00:03:46,460 --> 00:03:51,440
should have no problem running any spawn

82
00:03:48,350 --> 00:03:53,500
duties in this data center so we're on

83
00:03:51,440 --> 00:03:55,970
the back side and the ha guy out here

84
00:03:53,500 --> 00:03:59,900
talked a little bit about the electrical

85
00:03:55,970 --> 00:04:03,440
we've got 60 amp PDUs which are the best

86
00:03:59,900 --> 00:04:06,520
size to use with these particular SP 31

87
00:04:03,440 --> 00:04:09,440
s & SP 35 s we can get three servers per

88
00:04:06,520 --> 00:04:12,890

per PDU there's a couple of options

89

00:04:09,440 --> 00:04:14,750

these are very cheap PDUs there's a

90

00:04:12,890 --> 00:04:17,630

couple brands we can get for you know

91

00:04:14,750 --> 00:04:21,590

under \$300 they're just metered they're

92

00:04:17,630 --> 00:04:24,590

not switched or managed so one of the

93

00:04:21,590 --> 00:04:27,260

options is to put in a remote power

94

00:04:24,590 --> 00:04:29,270

cycle for each power bar so either you

95

00:04:27,260 --> 00:04:32,180

can buy it with that in which probably

96

00:04:29,270 --> 00:04:34,610

brings the whole cost way too high or we

97

00:04:32,180 --> 00:04:35,980

put a relay system in so remotely you

98

00:04:34,610 --> 00:04:37,750

can come in and you

99

00:04:35,980 --> 00:04:39,940

shut down each individual power bar so

100

00:04:37,750 --> 00:04:40,900

if you have to reset power supplies at

101

00:04:39,940 --> 00:04:43,660

the most you're going to take three

102

00:04:40,900 --> 00:04:48,100

servers down at a time so this one has

103

00:04:43,660 --> 00:04:51,100

six six PDUs and you know we go up from

104

00:04:48,100 --> 00:04:52,300

there with a 400 amp unit that has 36

105

00:04:51,100 --> 00:04:54,280

servers we're gonna have to have more

106

00:04:52,300 --> 00:04:57,430

PDUs and we have ones that are quite a

107

00:04:54,280 --> 00:04:59,200

bit smaller than this as well so let's

108

00:04:57,430 --> 00:05:00,850

go over some of the options the very

109

00:04:59,200 --> 00:05:03,100

base unit we went through already now we

110

00:05:00,850 --> 00:05:05,860

can add on options on top of the price

111

00:05:03,100 --> 00:05:08,260

that we talked about some of the options

112

00:05:05,860 --> 00:05:09,430

could include an amount of automatic

113

00:05:08,260 --> 00:05:11,260

transfer switch so if you have two

114

00:05:09,430 --> 00:05:12,820
different sources of power and you lose

115

00:05:11,260 --> 00:05:14,770
one you can switch automatically to the

116

00:05:12,820 --> 00:05:16,260
other source of power so you don't you

117

00:05:14,770 --> 00:05:18,310
know you don't stay down very long

118

00:05:16,260 --> 00:05:23,130
there's a lot of automation that we can

119

00:05:18,310 --> 00:05:25,930
add in so what we can do is put in a PLC

120

00:05:23,130 --> 00:05:27,190
this one doesn't have a PLC but we're

121

00:05:25,930 --> 00:05:29,860
going to be putting that in and testing

122

00:05:27,190 --> 00:05:32,470
it and what these are are variable speed

123

00:05:29,860 --> 00:05:34,570
controllers for the fans so with the PLC

124

00:05:32,470 --> 00:05:38,200
and the fan controllers we can control

125

00:05:34,570 --> 00:05:40,420
and maximize the power that's consumed

126

00:05:38,200 --> 00:05:42,760

by the fans and keep all the

127

00:05:40,420 --> 00:05:45,370

temperatures automatically in sync in

128

00:05:42,760 --> 00:05:46,900

the unit without this with just switches

129

00:05:45,370 --> 00:05:49,630

we just turn the fans on full-blast and

130

00:05:46,900 --> 00:05:52,930

it it runs less than optimal but it

131

00:05:49,630 --> 00:05:55,090

still works fine with these with with

132

00:05:52,930 --> 00:05:56,680

this here what what this is is a power

133

00:05:55,090 --> 00:05:59,140

meter it's a remotely managed power

134

00:05:56,680 --> 00:06:02,230

meter and it gives you the full power

135

00:05:59,140 --> 00:06:05,890

usage kilowatt hours how much on every

136

00:06:02,230 --> 00:06:11,200

phase how many volts how many amps and

137

00:06:05,890 --> 00:06:13,060

it's all remotely monitor Balazs well we

138

00:06:11,200 --> 00:06:15,190

have a monitoring server in here as well

139

00:06:13,060 --> 00:06:18,670

and the monitoring server would run our

140

00:06:15,190 --> 00:06:23,080

DCIM software called QoS and that will

141

00:06:18,670 --> 00:06:25,710

monitor everything PDUs servers routers

142

00:06:23,080 --> 00:06:28,060

switches anything that can be monitored

143

00:06:25,710 --> 00:06:30,130

funnels back into this monitoring

144

00:06:28,060 --> 00:06:32,230

software one of the things we are

145

00:06:30,130 --> 00:06:33,790

working on is getting your scripts

146

00:06:32,230 --> 00:06:36,490

incorporated into that too so we can do

147

00:06:33,790 --> 00:06:38,890

some remote group management to the

148

00:06:36,490 --> 00:06:41,080

servers as well as seeing a rollup of

149

00:06:38,890 --> 00:06:45,360

all the servers temperatures of Asics

150

00:06:41,080 --> 00:06:48,389

temperatures front and back you know our

151
00:06:45,360 --> 00:06:50,009
the hash rates we can Rican Hickey lurtz

152
00:06:48,389 --> 00:06:51,900
out then so as soon as your hash rate

153
00:06:50,009 --> 00:06:53,280
goes below a threshold it'll kick you on

154
00:06:51,900 --> 00:06:55,110
molar and you'll know that there's

155
00:06:53,280 --> 00:06:58,099
something wrong with psu or something

156
00:06:55,110 --> 00:06:58,099
wrong with the internet connection

157
00:06:59,840 --> 00:07:02,669
another thing we can do is fire

158
00:07:01,710 --> 00:07:04,590
suppression we don't have fire

159
00:07:02,669 --> 00:07:08,069
suppression here but we do have a fire

160
00:07:04,590 --> 00:07:11,280
alarm and smoke alarm we can do early

161
00:07:08,069 --> 00:07:14,460
fire early smoke detection we can also

162
00:07:11,280 --> 00:07:16,469
do Novak 12:30 which is gasps fire

163
00:07:14,460 --> 00:07:19,050

suppression we know that with all this

164

00:07:16,469 --> 00:07:22,680

power it's hot and you know we've seen

165

00:07:19,050 --> 00:07:24,150

fires in places in the industry so you

166

00:07:22,680 --> 00:07:26,580

know that would probably be an option

167

00:07:24,150 --> 00:07:28,259

people who want to choose security we

168

00:07:26,580 --> 00:07:30,360

have internal cameras external cameras

169

00:07:28,259 --> 00:07:32,279

again those all tie into the DCIM and

170

00:07:30,360 --> 00:07:35,580

they can alert on motion that can alert

171

00:07:32,279 --> 00:07:38,189

on on any of those things we can also

172

00:07:35,580 --> 00:07:39,840

tie in to the plc the lighting system so

173

00:07:38,189 --> 00:07:42,360

if you want to see with your camera

174

00:07:39,840 --> 00:07:44,909

inside the unit remotely you can then

175

00:07:42,360 --> 00:07:47,189

send a remote lights on command lights

176

00:07:44,909 --> 00:07:49,949

will come on you can see your servers a

177

00:07:47,189 --> 00:07:51,870

lot better it's also security access

178

00:07:49,949 --> 00:07:54,509

control so you can do card access on the

179

00:07:51,870 --> 00:07:56,190

doors this all comes from our enterprise

180

00:07:54,509 --> 00:07:57,629

data centers but these are options that

181

00:07:56,190 --> 00:08:00,779

anyone can do if they're worried about

182

00:07:57,629 --> 00:08:03,779

security as well we also have

183

00:08:00,779 --> 00:08:06,479

environmental monitoring so this is this

184

00:08:03,779 --> 00:08:08,669

is one of the units that we use and it's

185

00:08:06,479 --> 00:08:09,960

it's really quite slick we have four

186

00:08:08,669 --> 00:08:12,210

different temperature control

187

00:08:09,960 --> 00:08:14,219

temperature sensors in here so we

188

00:08:12,210 --> 00:08:16,919

monitor temperatures in four different

189

00:08:14,219 --> 00:08:19,500

locations outside the unit air coming in

190

00:08:16,919 --> 00:08:21,589

air on the back air on the front and

191

00:08:19,500 --> 00:08:26,669

then we also have a airflow control

192

00:08:21,589 --> 00:08:29,729

dewpoint humidity sensor as well not

193

00:08:26,669 --> 00:08:33,740

only that we do have a water detector if

194

00:08:29,729 --> 00:08:36,060

we have a supplemental water cooling or

195

00:08:33,740 --> 00:08:37,289

evaporative cooling we want to have the

196

00:08:36,060 --> 00:08:39,690

water sensor in case something goes

197

00:08:37,289 --> 00:08:41,699

wrong and the water starts coming in the

198

00:08:39,690 --> 00:08:44,699

nice thing about this is we also have

199

00:08:41,699 --> 00:08:47,700

relays so we can actually output two

200

00:08:44,699 --> 00:08:51,210

relays and turn things on and off

201
00:08:47,700 --> 00:08:53,010
dialers alarms lights basically anything

202
00:08:51,210 --> 00:08:57,030
with an on/off we can control through

203
00:08:53,010 --> 00:08:59,370
this unit and what else we have Oh door

204
00:08:57,030 --> 00:09:02,580
sensors so you can see here we've got a

205
00:08:59,370 --> 00:09:04,470
door sensor off can't see but we have

206
00:09:02,580 --> 00:09:06,240
door sensors open and closed so you'll

207
00:09:04,470 --> 00:09:09,060
get an alert if you want to set that up

208
00:09:06,240 --> 00:09:10,230
you can do an alert that'll that'll tell

209
00:09:09,060 --> 00:09:11,750
you that someone's open the door so

210
00:09:10,230 --> 00:09:15,780
let's close the door

211
00:09:11,750 --> 00:09:18,990
you've got na sa firewall so what we can

212
00:09:15,780 --> 00:09:21,570
do with the firewall clearly remember

213
00:09:18,990 --> 00:09:22,800

the firewalls we can we can get a secure

214

00:09:21,570 --> 00:09:25,590
connection into here if you have

215

00:09:22,800 --> 00:09:27,360
multiple units in multiple places you

216

00:09:25,590 --> 00:09:28,980
can have your own private VPN network

217

00:09:27,360 --> 00:09:31,260
between and you can monitor them all

218

00:09:28,980 --> 00:09:33,240
through that through that network also

219

00:09:31,260 --> 00:09:34,380
just gives you another layer of

220

00:09:33,240 --> 00:09:35,940
protection against people coming from

221

00:09:34,380 --> 00:09:37,440
outside in to the servers

222

00:09:35,940 --> 00:09:39,960
we'll start it up for you so you can

223

00:09:37,440 --> 00:09:42,210
have a look at what how it works and how

224

00:09:39,960 --> 00:09:43,950
easy it is to get going once all the

225

00:09:42,210 --> 00:09:47,520
servers obviously are in place it's

226
00:09:43,950 --> 00:09:51,150
pretty easy we just have each PDUs on a

227
00:09:47,520 --> 00:09:53,640
60 amp breaker so we light it up and

228
00:09:51,150 --> 00:09:56,510
three of the servers come up so we've

229
00:09:53,640 --> 00:10:00,440
got these three down here start it up

230
00:09:56,510 --> 00:10:00,440
you don't leave it running too long

231
00:10:00,450 --> 00:10:05,850
so

232
00:10:02,200 --> 00:10:05,850
keep and switches

233
00:10:06,850 --> 00:10:12,970
they're running at about 50% right now

234
00:10:10,180 --> 00:10:16,290
so I'll just always get them going those

235
00:10:12,970 --> 00:10:16,290
three fans running in 50

236
00:10:23,130 --> 00:10:26,180
and this all about me

237
00:10:28,480 --> 00:10:31,230
have the automated

238
00:10:41,920 --> 00:10:46,889

can see that royal airflow coming

239

00:10:44,260 --> 00:10:46,889
through here

240

00:10:47,230 --> 00:10:51,070
18,000 CFM right now

241

00:11:11,950 --> 00:11:16,380
olá server tacos over

242

00:11:24,040 --> 00:11:29,310
okay so that's our overview is always

243

00:11:26,920 --> 00:11:29,310
showing

244

00:11:33,590 --> 00:11:36,850
we'll be able to handle your next

245

00:11:34,700 --> 00:11:36,850
generation

246

00:11:39,040 --> 00:11:46,010
next generation you can win

247

00:11:42,480 --> 00:11:46,010
now at a 400 our unit

248

00:11:47,250 --> 00:11:52,540
or factor not to the 24

249

00:11:49,310 --> 00:11:52,540
but you have a lot of

250

00:11:53,070 --> 00:11:56,090
a good way to do it

251
00:12:02,660 --> 00:12:04,720
you