



4G Services

What's Here and What's Near

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Mitchell • Nashville • Springfield • Rapid City • Sioux Falls • Wichita**

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4G Technology Platform

Wireless	Enables “Anywhere” (mobile or fixed)
IP at the core	Enables “Anything” (MMS)
High Speed	Meets customer expectations
Applications and Services	Enhances existing IP platforms and enables new services
Leverages infrastructure	Improve infrastructure efficiency
Good for small/rural markets	Speed and reach in high cost environments

Convergence – IMS visions

4G Applications



Fixed



*The Converged Network
Edge Out Configuration*

Internet



Connected
Devices



Mobile



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4G Service Definitions

- 4G Services: Combinations and permutations limited only by your imagination..
(And some regulations)
- Data
 - Access the WWW – from anywhere
 - Mobility – laptop, companion devices, smart phones
 - Smart devices – camera, printer, storage
- Voice
 - Further convergence with the “home phone” concept
 - Drive for competitive apps – conference, intercom, attached to multimedia
- Multimedia
 - The picture and the thousand words together
 - Real time video sharing on the small screen
 - Video conferencing
 - Over the top video and audio

4G Service Commercial Drivers

- Somebody is going to make a buck
- The Internet – how did we ever live without the immediate access to research information, shopping opportunities, entertainment, email, phone numbers and locations for absolutely EVERYTHING we do...
- How patient will subscribers be for over-the-top-video on the small screen?
- Music files to fit the moment
- Video collaboration
- Share the location
- Security – the convenience of a friend with the comfort of a witness
- M2M communication – your car as a multimedia star attraction
- Extend the home network – printers, storage, PCs
- Limited only by

Your imagination – and some regulation

4G Technology Expectations

- LTE (3GPP) – provides Max 16.3 Mb/s per Mhz of spectrum available – reality is closer to 5 Mb/s
- WiMax (IEE 802.16) - speed 4.8 Mb/s per Mhz of spectrum available
- Frequently offered with “companion devices”
- Sprint reports less churn with 3G/4G customers

4G Technology Expectations – Net Neutrality

Like a
Not too
Unless
need it



...LY

...ING

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4G Challenges

- Your Network and the WWW:
 - May not melt down but it is sure going to heat up!
- Carriers currently reporting network congestion issues as smart phone applications come online
- Only partially converted to 3G
- Network congestion will get worse maybe by as much as a factor of 10
- Backhaul requires DS3 pipes probably becoming GigE due to equipment economies
- Opportunity or challenge?
- Consumers expectations will adjust – quickly – driving build-out

4G Services – What’s Here

- How long do we have to get ready for the opportunities and challenges? – Are we there yet?
 - Now to Very Soon
 - WiMax is here
 - CLEAR says 60 markets and growing, leading platform for international implementation
 - LTE
 - Verizon appears to be trying to get a jump on ATT
 - Verizon launching 6 month trial soon, announced intention to roll out “as close to all-at-once as possible”
 - ATT has announced major drive in 2011
 - Telefonica, Verizon, Vodafone, China Mobile, MetroPCS, NTT DoCoMo
 - Very Soon to Soon
 - One to two years

4G Services – What's Near

- How long do we have to get ready for the opportunities and challenges? – Are we there yet?
 - Now to Very Soon
 - Very Soon to Soon
 - Verizon NFL city rollout
 - CLEAR rollout continues
 - AT&T must do something
 - iPhone – exclusive agreements expire in 2010
 - Verizon and NTT will be driving for handsets in late 2010
 - One to two years

4G Services – What's Not So Near

- How long do we have to get ready for the opportunities and challenges? – Are we there yet?
 - Now to Very Soon
 - Very Soon to Soon
 - One to two years
 - Consumers will be moving to broadband applications that allow tethered or wireless experiences with smooth transitions
 - Subscribers will continue to sacrifice some portion of the experience to attain mobility
 - Winners will be the quickest with the best toys

4G: What's Here and What's Near

- Q&A