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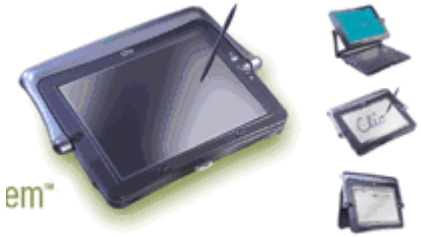
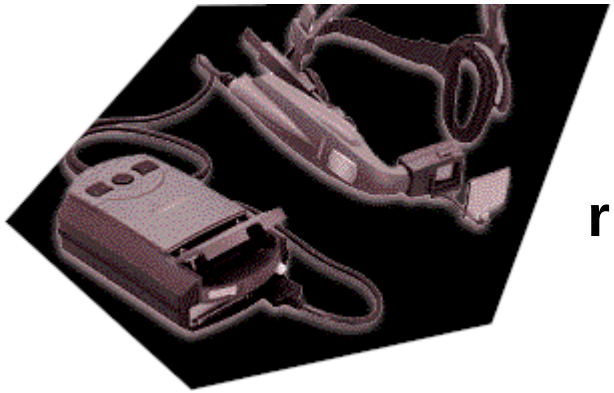
Boeing QoS User Experience



Richard H. Paine
Phantom Works
E&IT
richard.h.paine@boeing.com



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Boeing QoS

- **Terms**
- **Boeing Multimedia in the Network**
  - Video
- **Boeing VOIP Requirements**
- **Boeing Wireless and Mobility Requirements**
  - VOIP over WLANs
  - Video over WLANs
- **Boeing QoS Now**

Some Terms of QoS

Middleware
QOS
Differentiated Services
Integrated Services
Label Switching
Network Middleware (low speed links)
Voice Over IP (VOIP)
Video Over IP
Voice Quality
Video Quality
Voice Interworking
Service Level Agreements (SLAs)
Session Initiation Protocol (SIP)

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What is QoS Used for at Boeing?

- **Nothing so far**
- **Expected: Video and VOIP streaming**
- **Cisco House**
  - **Skinny Protocol**
  - **QPM**
  - **SIP Commitment**

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Boeing Video History

- 1998 Boeing Outsource of switched voice services
- 1999 Multimedia Lab
- 2000 Multicast Pilot
- 2001 Multicast Deployment in Puget Sound, 2002 others
- Video deployment of executives conveying messages to employees
- Internet2 Access Grid Prototype
- Reliable Multicast requirements

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Boeing VOIP History

- 1998 Boeing Outsource of switched voice services
- 1999 Published VOIP Vision and Architecture
- 1999 VOIP for overseas (SITA Network, Cisco protocols)
- 2000 VOIP Pilot for Corinth Texas
- 2000 VOIP Pilot for “greenfield” VOIP Deployment (Issaquah)
- 2001 VOIP Pilot for Ogden/Salt Lake

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Boeing VOIP QoS Approach

- Isolate VOIP in VLANs
- Single ethernet switch outlet per seat (600 seats in Issaquah)
- “Throw bandwidth at the problem” approach

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VOIP Requirement

Boeing VOIP Strategic Architecture

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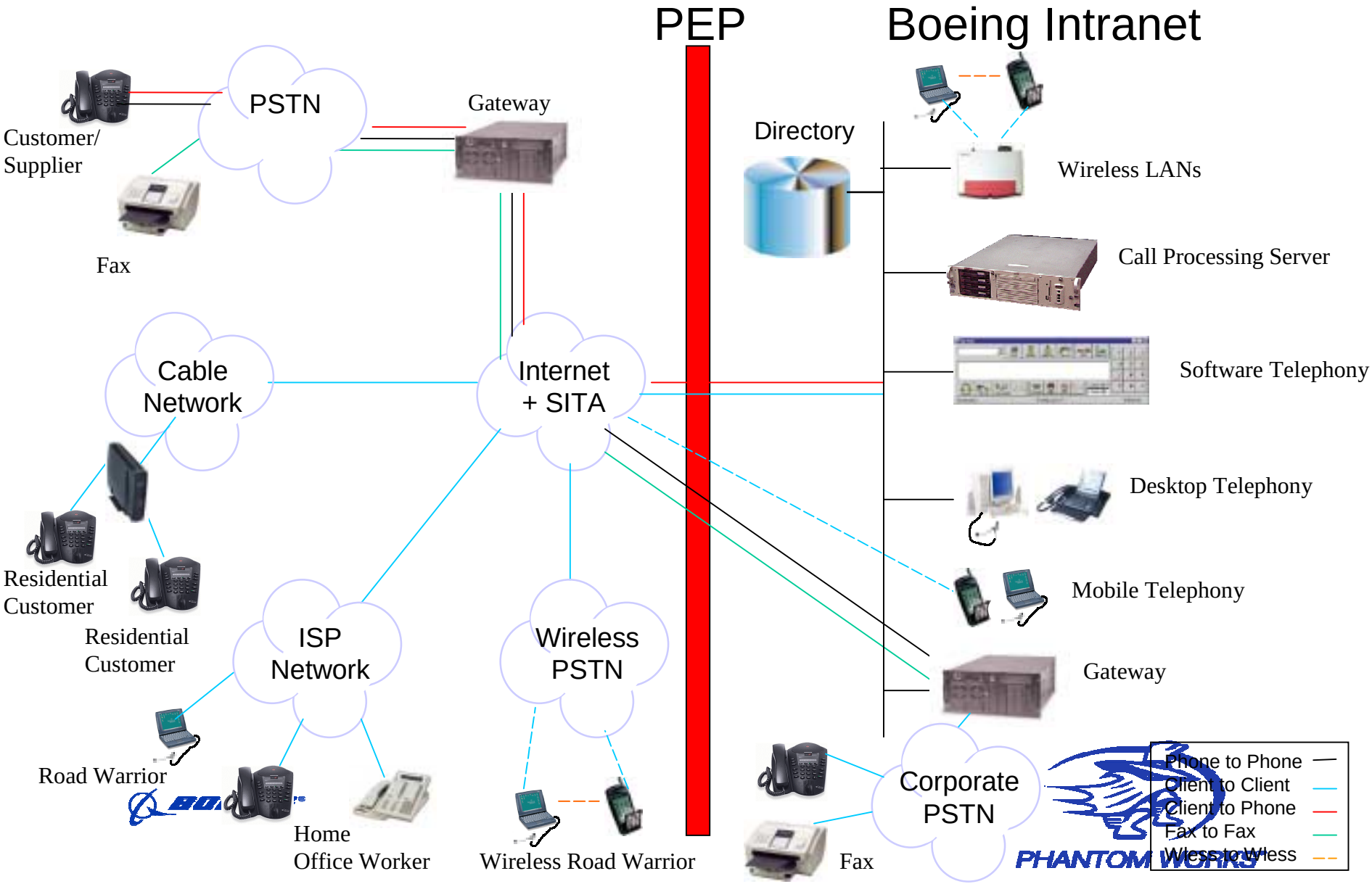

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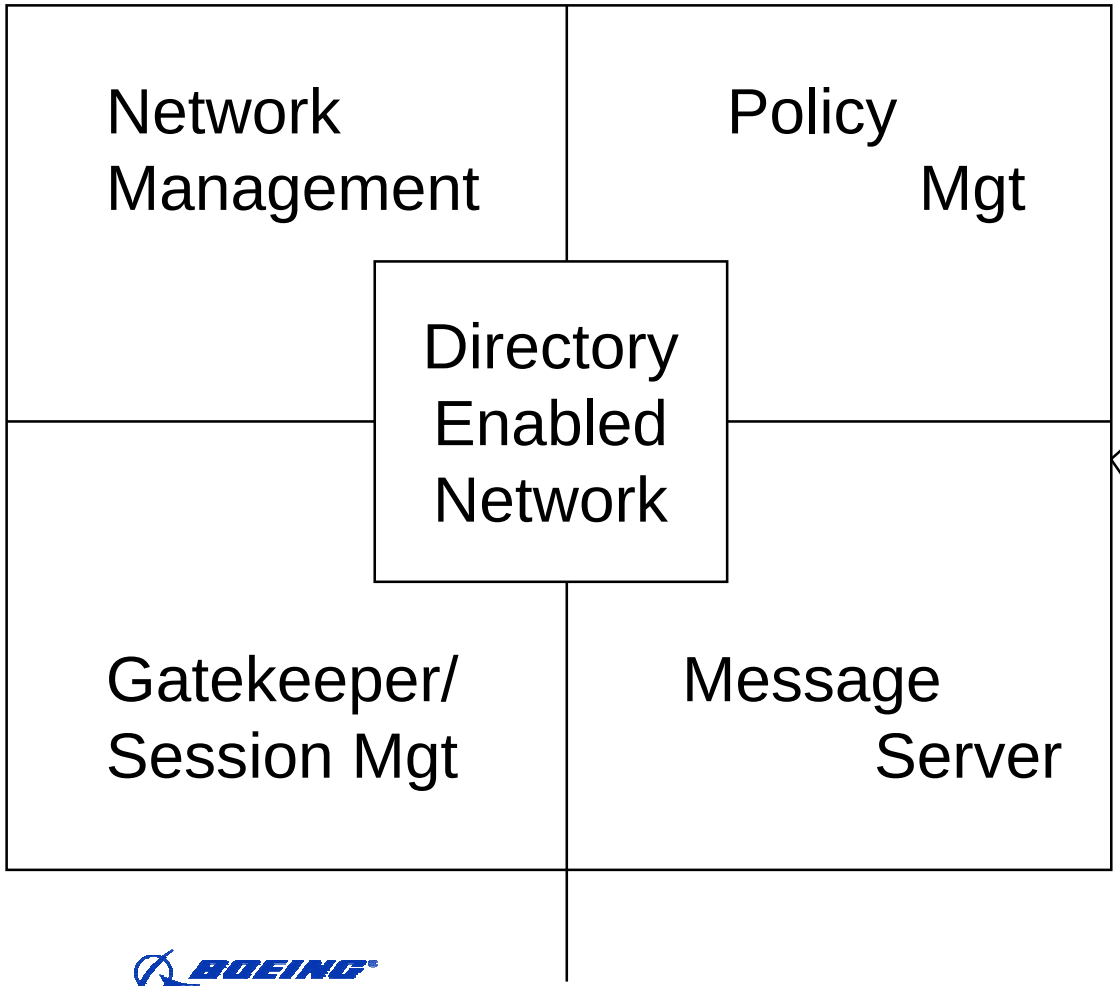
VOIP Services



Service Profile, Class of Service, Policy Mgt
Call Mgt & Routing
PSTN Access Manager
Directory
Conferencing
Address Conversion
QOS Management
Call Detail Recording
Zone Management
E911 Support
Voice Messaging
Security
Trouble Shooting Tools

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Cisco's QPM Technologies

Inbound to Outbound

Color	Limiting	Queuing for Congestion - Outbound	Queuing for Avoidance - Outbound	Signaling
Policy-Based Routing PBR	Generic Traffic Shaping GTS	First In – First Out FIFO		IP Precendence
Committed Access Rate CAR	Frame Relay Traffic Shaping FRTS	Priority Queuing PQ		RSVP
	Limiting Routers	Custom Queuing		
	Limiting Switches	Weighted Fair Queuing WFQ		
		Class-based Weighted Fair Queuing		
		IP RTP		
		Weighted Round Robin WRR		
		2Q – 2T		

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QoS Priorities

1. Throw bandwidth at the problem
2. Supply QoS for low speed links without other option
3. 2.5G and 3G generally will require QoS
4. WLAN QoS Built In (sort of)

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QoS for VOIP Over WLANs

- 802.11e offers QoS for streams
- 802.11a offers higher speeds “throw bandwidth at the problem”
- 802.11 Wireless Next Generation (WNG) is working on the next generation of higher speeds

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Boeing QoS Now

- Need for QoS applied to VOIP for all VOIP
- Cisco QPM Pilot
- Reliable Multicast Prototype

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