Technology Directions for IP Infrastructure

GH 3/7/00

IPV6

- "IP with larger addresses"
- Address space requirements are no longer being easily met by IPv4
- This is an issue for:
  - GPRS mobile
  - 3G mobile
  - WebTV
  - Pocket IP devices
- IPV6 appears to offer reasonable technology solutions that preserve IP integrity, reduce middleware dependancies and allow full end-to-end IP functionality
- Issues are concerned with co-existence with the IPv4 base and allowing full inter-working between the two protocol domains

IP Transport

- Requirement to carry increasing volumes of payload at increasing carriage efficiency
- Current focus at the IP transport technologies of
  - POS (Packet over Sonet)
  - Dynamic Packet Transport
  - 10Gigabit Ethernet
- Issues of operations and management of these technologies, including robustness, resilience and progressive failure modes of operation
  - IP Routing protocol robustness, convergence and stability
  - Traffic Engineering technologies
  - Optical Wavelength Switching and Optical Cross-Connect technologies

IP VPNs

- Sharing the base packet switching platform by a collection of IP networks
- Issues of integrity of the platform and integrity of the offered IP service to the VPN client
- Critical areas of technology development include
  - MPLS – Multi-Protocol Label Switching
  - MPR – Multi-Protocol Routing
  - VLANS – Virtual LAN Packet Frame formats
  - IPSEC – end-to-end IP authentication and encryption services
  - QoS – various forms of Quality of Service network mechanisms
  - PPP / MPLS / VLAN / VC inter- working – the enterprise-wide VPN service model
  - Dynamic VPN technologies

IP Extensions & Refinements

- IP Multicast technologies
  - Extension of IP into support of common broadcast / conferencing models
  - Large-scale multicast
  - Small-scale multicast – conferencing
- IP Mobility
  - IP support of mobility functions for mobile nosts and mobile subnets
- IP QoS
  - IP support of distinguished service responses from the network

Services and Middleware

- WWW caching technologies
- Service provision and IP Anycast
- Directory technologies
- Multi-Lingual DNS
- VOIP technologies and interworking