



LEADING SOFTWARE COMPANY IN VIETNAM

Router Development Projects



Sample Router Development Projects

- ❖ *Multi-Service Provider Edge*
- ❖ *Broadband Remote Access Server*
- ❖ *Service Edge Router*
- ❖ *Universal Convergence Gateway*



Multi-Service Provider Edge (1/2)



❖ Products:

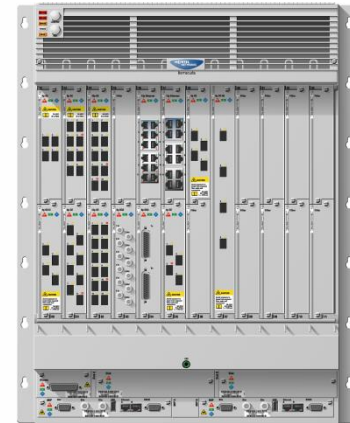
- Next-generation IP/MPLS multiservice edge - a single, powerful packetized infrastructure that delivers voice, video, data, and wireless services.

❖ Scope of Work:

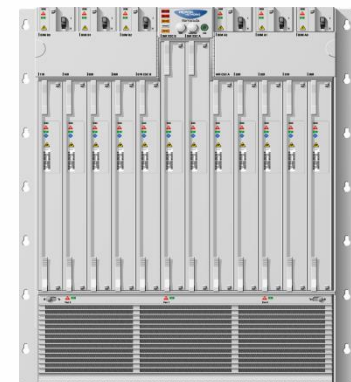
- Develop new features, sustaining on Data-path & Networking
- Develop test plans, test cases, and test scripts
- Execute functional, system, regression, and performance test
- Develop automation test framework
- Maintain and enhance test scripts

❖ Technologies:

- Modern mid-plane architecture design
- Networking
 - *IP/MPLS, frame relay, serial line, ATM, Ethernet, PPP, IPSec, DSL, etc.*
 - *TCP, UDP, HTTP/HTTPS, FTP, TFTP, IP-VPN, L2TP, routed IP*
- Software, languages, and tools
 - *C/C++, Java*
 - *Wireshark, Net-SNMP, SNMPc, IxExplorer/IxLoad*
 - *IXIA, Spirent, ATS Automation Test Framework*



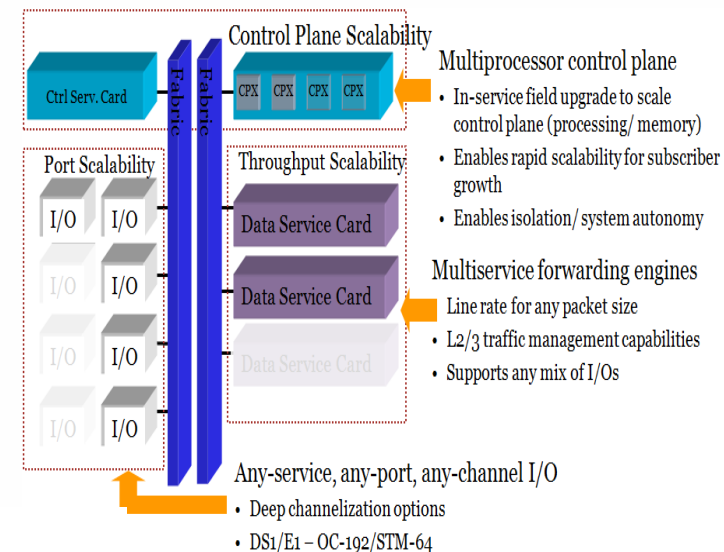
I/O Side



Compute Side

❖ Embedded Systems:

- Fully deterministic performance – no reliance on flow cache hit rate
- A PowerPC™ MPC7447 G4 processor running at 600 MHz with on-chip 512 kbyte L2 cache and MPX, running in a single-processor configuration.
- A Marvell Discovery II system controller.
- 512 Mbyte of DDR-SDRAM memory.
- A 64/32-bit PCI bus running at 32/66 MHz.
- 64 Mbyte of onboard Flash memory.
- Dual/independent gigabit Ethernet interfaces.
- Dual serial interfaces.
- Embedded Operating System: CG Linux
- Flexible mid-plane architecture
- High-density I/O
- Network Processor Data Path
- Control Plane Engine Scalability
- Line rate forwarding at any packet size
- Built In Scalability
- Card re-use across product family



Broadband Remote Access Server (1/2)



❖ Products:

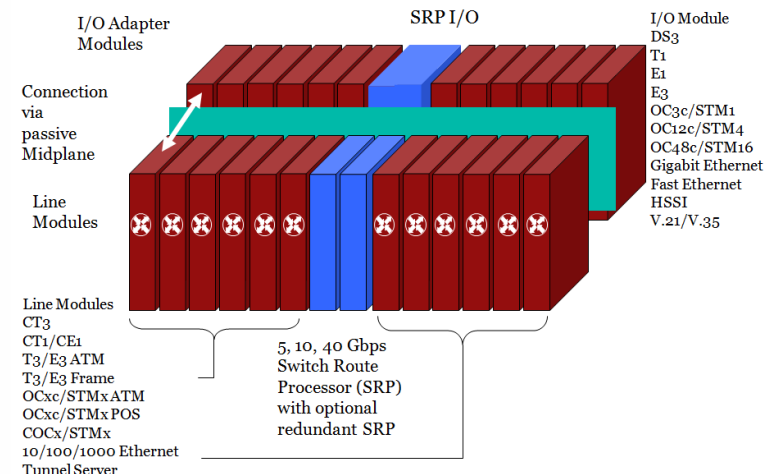
- Broadband Services Router is a high-performance router designed for large points of presence (PoPs).
- An edge routing platform that is optimized for large circuit aggregation applications

❖ Scope of Work:

- Develop new features, sustaining, hotfix
- Develop test plans, test cases, and test scripts
- Execute functional, system, regression, and performance test
- Develop automation test framework
- Maintain and enhance test scripts

❖ Technologies:

- Networking
 - *IP, PP PPP, PPPoE, PPPoA, DHCP, AAA, Radius*
 - *TCP, UDP, HTTP/HTTPS, FTP, TFTP*
 - *Multicast routing, DVMRP, PIM*
- Software, languages, and tools
 - *C/C++, Java*
 - *IXIA, Spirent, Automation Test Framework*



Broadband Remote Access Server (2/2)

❖ Leverage ASIC + RISC

Processor Architecture:

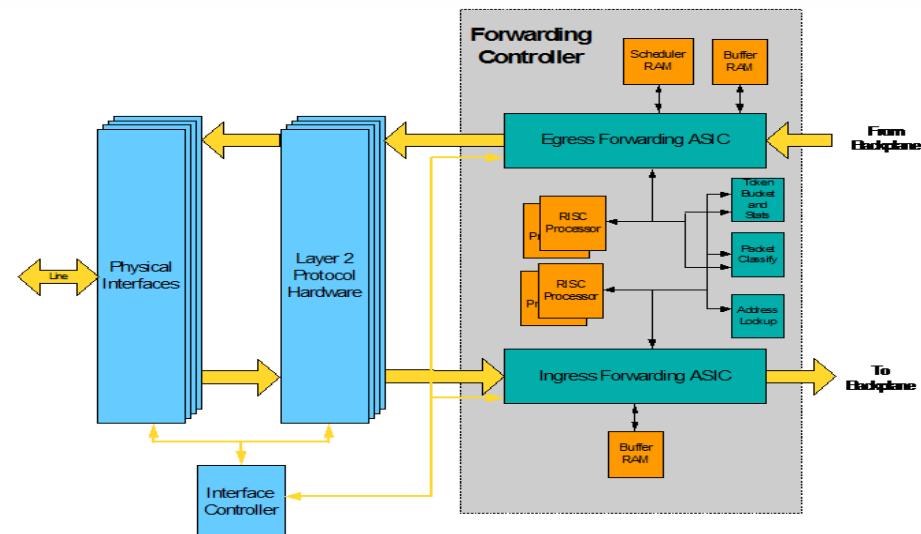
- RISC processor provides flexibility
- ASICs and FPGAs provide hardware assist to achieve high performance
- Fully deterministic performance – no reliance on flow cache hit rate

❖ ASIC and FPGA Functions:

- Buffer management
- Queue management
- QOS scheduling
- Address lookup
- Flow classification
- Flow rate measurement
- Statistics support

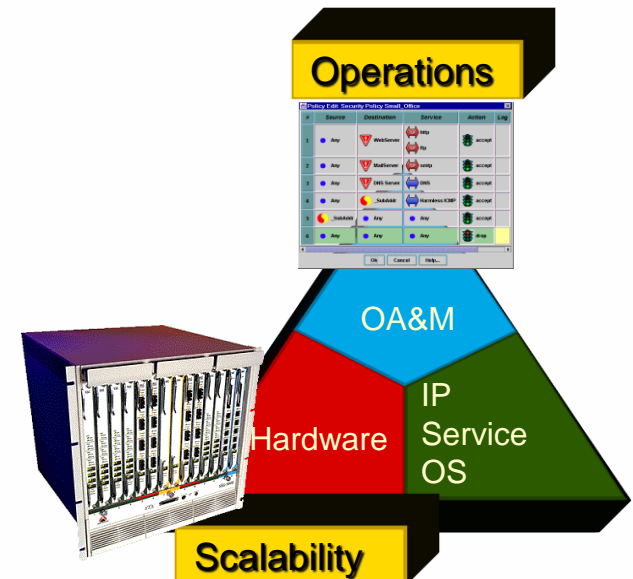
❖ RISC Processor Functions:

- RISC processor provides flexibility
- L2/L3 packet header parsing
- L2/L3 packet header modifications
- QOS control
- Classification control
- Statistics control



Service Edge Router (1/2)

- ❖ **Product:** Combining network transport services and IP services in one MPLS platform and a gateway between GPRS/UMTS and other external packet data networks such as radio networks, IP networks, or private networks.
- ❖ **Scope of Work:**
 - New Feature Development
 - Maintenance
 - Product Verification/Testing
 - Technical Support



Service Edge Router (2/2)

❖ Technologies

- Embedded and Real-time OS: VxWorks, RT-Linux
- IP Service Operating System
 - *Software framework and libraries for IP applications*
- Networking
 - *Layer 2-3*
 - *IP services (traffic shaping, NAT, DDoS, etc.)*
 - *VPN, VPRN, ATM, Frame Relay, MPLS*
 - *GTP, GTP Billing, RADIUS Authentication/Accounting*
- Software, Languages, and Tools
 - *C/C++, Java, CORBA, TCL, SilkTest*
 - *STAF, W32/mshtml, Wireshark, IxExplorer/IxLoad*
 - *IXIA, Spirent, ATS Automation Test Framework*
 - *Net-SNMP, SNMPC*

- ❖ **Product:** FMC (Fixed Mobile Convergence) platform that concurrently supports 3GPP, 3GPP2, ETSI and PacketCable standards for next-generation applications.
- ❖ **Scope of Work:**
 - Product verification
 - Automation development
 - Sustaining and new feature development
- ❖ **Technologies:**
 - VxWorks
 - Networking
 - *Layer 2-3, L2TP*
 - *IP services (traffic shaping, NAT, DDoS, etc.)*
 - *Virtual Router, VPN, VPRN*
 - *SIP ALG, SIP NAT ALG, SIP DoS, SIP authentication, SNMP, MPLS, OSPF, etc.*
 - C/C++, Java, TCL



THANK YOU !

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