IBM POWER NETWORK PROCESSOR ARCHITECTURE

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HIGH SWITCH CONNECTIVITY
- RIT1/3: 4 Gbps up to 64 ports
- Future: 10 Gbps up to 256 ports

SCHEDULER
- Traffic management, QOS
- Differentiated Services

MAC / Framers
- Switching
- Fabric
- PCI BUS
- NETWORK INTERFACE PORTS

FLEXIBLE PROTOCOL PROCESSORS
- Networking forwarding / filtering applications
- Layer 2, IP, IPX, Vlan... Internetworking up to Layer 7
- Packet classification
- Policing
- Firewall

Embedded PowerPC
- FM, LPM, SMT algorithm
- External CAM
- Use of DRAMs for large tables, counters...

VERSATILE NETWORK INTERFACE SUPPORT
- EPC DataFlow
- Scheduler

HIGH PORT CONNECTIVITY
- RIT1/3: 4 Gbps 1 to 40 ports
- Future: 10 Gbps 1 to 100 ports

COPROCESSOR
- CAMs
- Security
- Encryption... Ethernet, POS, ATM, Fibre Channel

Large Data Repository (up to 192 MB)
- Large Number of Frames (up to 512 k)
- Use of Memory Slices
- Frame Alteration
- Hardware Assist (well-known cases)
- Flexible (picocode) Frame Alteration
- Wrap
- Port Mirroring
- Debug & Sniffing functions
High level of integration in single chip
2x4 Gbps
3 DIFFERENT TREE TYPES TUNED FOR DIFFERENT APPLICATIONS:

- **FM = FIXED MATCH TREE**
  IDENTICAL SIZE FOR ALL THE KEYS OF THE TREE SUCH AS: L2 FORWARDING, VPI/VCI LOOK-UP, IPX FORWARDING, RSVP TRAFFIC MANAGEMENT POLICY

- **LPM = LONGEST PREFIX MATCH**
  VARIABLE LENGTH (BUT SAME STARTING POINT) KEYS IN THE TREE SUCH AS: IP FORWARDING, SUBNETTING CONCEPT

- **SMT = SOFTWARE MANAGED TREE**
  - ALL POSSIBLE COMBINATIONS OF NON-CONTIGUOUS BIT PATTERNS INSIDE THE KEYS OF THE TREE
  - RANGE COMPARISON (SMALLER/EQUAL/GREATER) FOR EACH BIT PATTERN SUCH AS: L3 FILTER RULES, L4 POLICIES
NO SCHEDULER

- 2 TARGET PORT QUEUES PER PORT (2 ABSOLUTE PRIORITIES)

SCHEDULER

- TRAFFIC MANAGEMENT PARAMETERS PER FLOW (CAN BE COMBINED):
  - GUARANTEED BANDWIDTH
  - BEST EFFORT WITH WEIGHTED FAIRNESS
  - MAXIMUM CONTROLLED BANDWIDTH (WITH BEST EFFORT)
  - MAXIMUM BURSTSIZE
  - PRIORITY (LOW LATENCY PARAMETER)