Carrier Grade Router / Switch Products
[Guaranteed IP Networks]

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Contents

• What is ALAXALA?
• Guaranteed IP Network Concept
• Products Line-up
• Technologies for Guaranteed IP Network
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• Summary
Ala Wing (Customers)  X  Ala Wing (Our Company)

Development, Manufacturing, Sales,
and Maintenance of Routers and Switches
ALAXALA Networks

- Established: October 1st, 2004
- Capital: about 55M$ (5,500M¥)
- Employee: 320 (as of Oct / 2004)
- Head Quarter: Shin-Kawasaki, Kanagawa JAPAN
- Product Line: AX series (High-End Router, High/Mid-range Switch)
Guaranteed Network

- Contribute to the establishment of a society rich in information and telecommunications.
- Provide user-friendly and security-conscious networks for the customers all over the world.
- Highly Reliable, Stable, and Secure Guaranteed Networks in IP/Ethernet Environments
Network Outage causing...

Disconnected from my network during this emergency!!!

Another system failure!!!! We’re losing business opportunities...

More trouble!!!! Tremendous loss of time and money...

User

Service Provider

Sler/Nler
Network Outage causes Significant Loss!


Network Downtime Causing Significant Revenue Losses
The Costs of Enterprise Downtime 2003, released today by Infonetics Research, concludes that network outages and degradations are causing significant losses in productivity and revenue, ranging from less than 1/10th of 1% of total revenue to almost 1% (up to $74.6 million) per year.
Towards Broadband Service Era

Dependable, Reliable & Stable Services over Guaranteed IP/Ethernet Networks

So far... (Best Effort Service)
IPv4 / v6 Ethernet
Wine Grass

Next Guaranteed Service
IPv4 / v6 Ethernet
Dependable Wine Grass
6 major features to support carrier grade services.
Guaranteed High Performance

AX7800 Architecture

- Crossbar Switch
- Packet Processing
  - Forwarer
  - Hierarchical Shaper
  - Routing Table
- Route Retriever

- Distributed Packet Processor
  - 320Gbps throughput
  - Smaller Pin counts
  - 1+1 Redundancy
- Wire-speed Packet Forwarding
- Wire-speed Packet Filtering
- Classified QoS/Queuing
- Single Engine for Multiple Forwarers
  - 20Gbps/chip
  - IPv6/IPv4 + Ethernet
  - Filter/QoS
Guaranteed Low Latency Switching

Low Latency and small delay variation
Delay sensitive application (VoIP, Real-time HD-Video)
Throughput / Transaction increase (smaller RTT)

Latency Comparison

<table>
<thead>
<tr>
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<th>Average latency (μsec)</th>
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<tr>
<td></td>
<td>Muticast</td>
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<tr>
<td>AX7800</td>
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Latency Sensitive Applications increase...

- Streaming
- VoIP
- Video On Demand
- Multicast
- HD Video (1.5Gbps)
- Bi-Directional TV (RTT 200ms)

RTT = Round Trip Time

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Highly Available AX series Architecture

Carrier Grade High-Availability
Architecture, Design and Manufacturing

Redundant
• Power Supply
• Switch fabric
• Routing Manager
Highly Available AX series Architecture

Carrier Grade High-Availability
Architecture, Design and Manufacturing

Parity/ECC check
• BAS
• ASIC interface
Guaranteed Quality of Service

AX series QoS (BW control, prioritizing) Supports

Multiple Application Consolidation (Triple-Play, etc)
Real time communication (voice video)
Mission Critical data communication

Critical Data
Voice
Video
Data

Prioritized Transmission
(Mission Critical Data, Voice, Video)

Non-Prioritized Transmission
(Usual Data)
Fine Granularity QoS

Hierarchical Packet Shaper
Flexible QoS configuration

Hierarchical Packet Shaping
Application Level Bandwidth inside a VLAN
VLAN Level Bandwidth Control inside a Ethernet Port

ATM-like QoS over Ethernet

Critical Data
Voice
Video
Data
High Availability Networking

GSRP (Gigabit Switch Redundancy Protocol)
L2 Switch Fail-over System

LAN Switch

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High Availability Networking

Standby-Link Aggregation to keep bandwidth
10G x 16(max.) Link Aggregation for 160G Link
Large Number IPv6 Multicast

Large number IPv6 Multicast for Voice, Sound and Video
• No Performance degradation (Hardware Multicast packet copy)
• Simultaneous copy to 8,000 subscribers
• Stable and dependable IPv6/v4 Multicast
Guaranteed Performance Monitors

Hardware Flow measurement and statistics
• Feed-back to continuous Network bandwidth design
• Early detection for suspicious Intrusion / DoS attack

![Diagram showing network components and hardware sampling]

• Hardware Sampling
  – No performance degradation
  – Large flow number (16,000 Max.)
• Multiprotocol (sFlow)
• Precise stat. (Netflow ver. 8.0, beyond)
Core Competence & Benefits

- Guaranteed High Performance
- Guaranteed Low Latency Switching
- Highly Available AX series Architecture
- Guaranteed Quality of Service
- Fine Granularity QoS
- High Availability Networking
- Large Number IPv6 Multicast
- Guaranteed Performance Monitors
## Product Roadmap

<table>
<thead>
<tr>
<th>Seg.</th>
<th>Year</th>
<th>2005</th>
<th>2006</th>
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<tbody>
<tr>
<td>High-End Router, Switch</td>
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<td><strong>NG High-End</strong></td>
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*1: 10GbEx4 Network Interface
*2: AX7800S
▲ : Shipping Target Date
Standardization Activities

1992
- Join WIDE Project

1992
- GateD Consortium

1999
- IETF IPv6 Contribution

2001
- IPv6 Promotion Council

2002
- JGN, JGNv6, IPv6 Forum

2002
- China-Japan IPv6 Project

2003
- IPv6 Ready Logo Program

2004
- JGN2

Continuous Contribution as “ALAXALA”
ALAXALA Networks established Oct. 1 2004
Aiming to Carrier grade IP Networking Products

Guaranteed IP Network
Supporting Highly available & Stable Infrastructure

AX series from Mid-range to High-End R/S
Based on own ASIC hardware routing
Dense 10G/GbE interfaces
IPv6,QoS, Link-aggregation, GSRP, Multicast, flow statistics

Continuous Carrier Grade Product roll-out

Part of ALAXALA’s activity supported by Ministry of Economy, Trade and Industry, Japan
Thank you!

http://www.alaxala.com/