

Compressor de tráfego

Teste de campo no backbone da RNP

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Agenda

- Motivação
- Compressores de tráfego
- Topologia
- Configuração
- Problemas enfrentados
- Resultados

Motivação

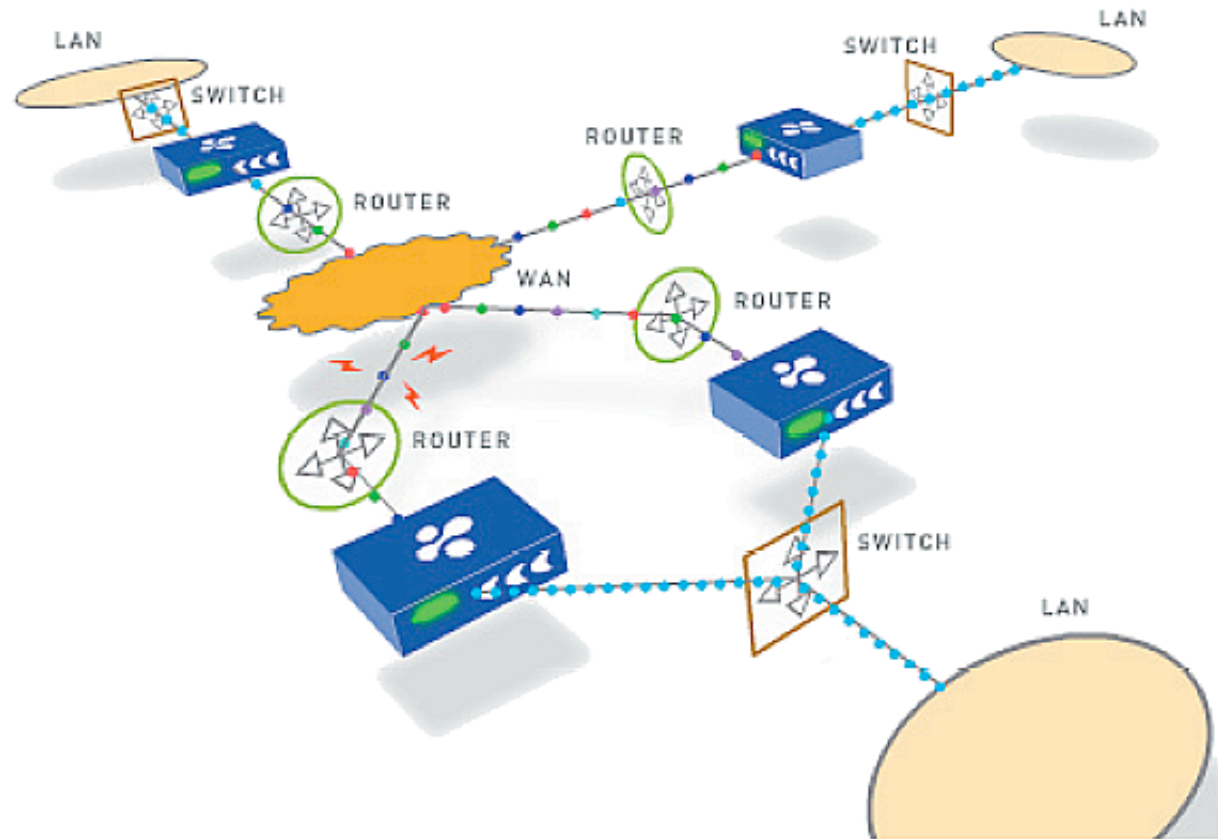
Cenário da época

- Circuito saturado;
- Preocupação com métricas de desempenho: perda e latência;
- Impossibilidade de atualização momentânea;
- Enlace entre DF e TO satisfazem os critérios acima;
- Empréstimo de hardware de compressão por fabricante, no caso um WX-50 da Juniper (ex-Peribit) por um mês;
- Caixa operou em regime de produção por 2 semanas.

Compressor de tráfego



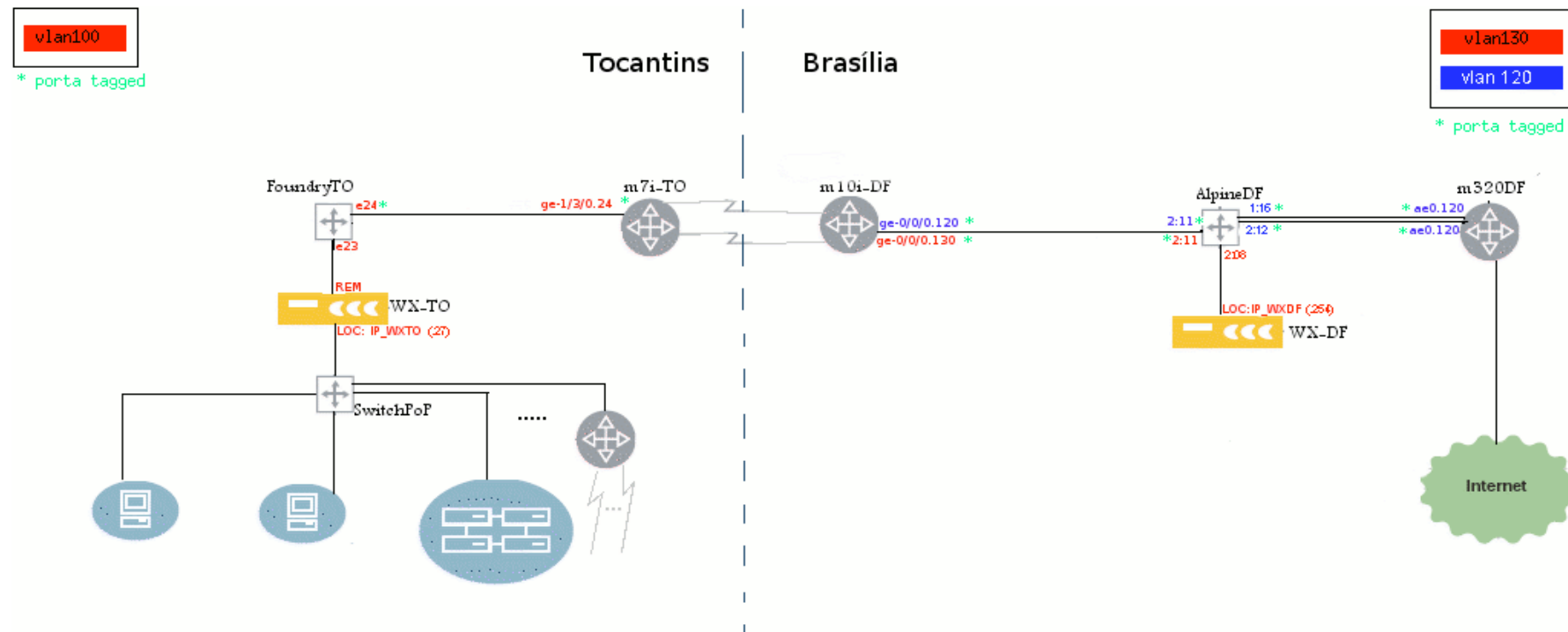
Idéia por trás do equipamento



Topologia do teste



Diagrama



Anunciando redes para compressão

Compression

Basic

- Endpoints
- Compression Subnets
- Application Filter

Advanced

- Remote Routes
- Load Balancing
- Default Decompressors
- Preferred Decompressors
- Tunnel Mode

Endpoints

Find: **GO**

Enable this device to DECOMPRESS traffic from all other WX devices

Enable this device to COMPRESS traffic destined for:

- ALL discovered WX devices
- ONLY WX devices designated as hubs
- ONLY checked WX devices below

Device name	IP address	Duties	Tunnel Status		Description
			OUT	IN	
<input checked="" type="checkbox"/> WX-TO	200.129.179.27		<input checked="" type="radio"/>	<input checked="" type="radio"/>	

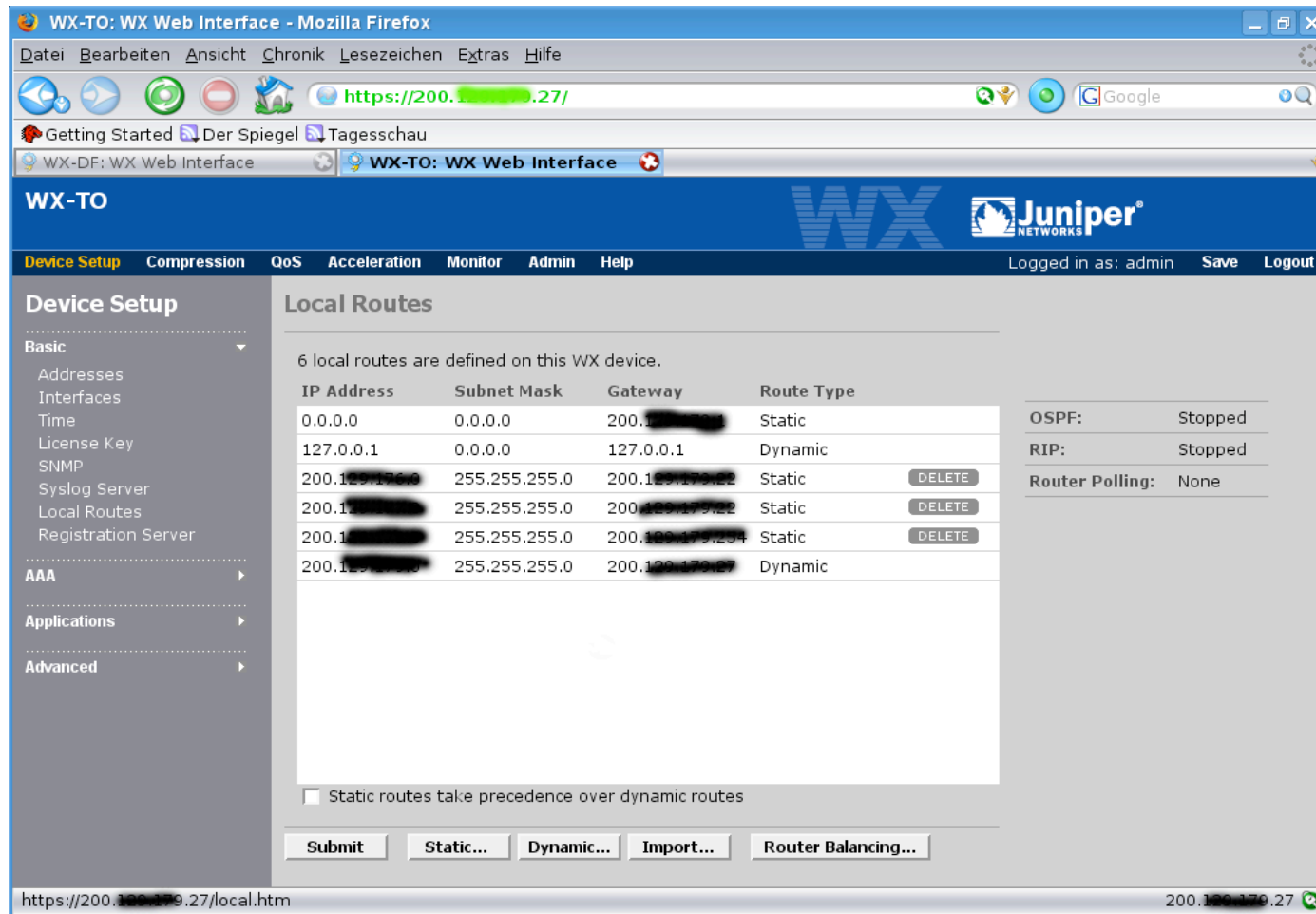
Select All **Clear** Click on the IP address to login to another device

Submit **Reset**

Legend

-  Hub
-  Spoke
-  Mesh
-  Registration Server
-  Secondary Reg. Server
-  Backup
-  Backup (Active)
- OUT** Compression tunnel from this device to remote device
- IN** Compression tunnel from remote device to this device
- Tunnel established
- No tunnel established
- Broken tunnel
- Temporarily Unavailable

Anunciando redes para compressão



WX-TO: WX Web Interface - Mozilla Firefox

https://200.100.179.27/

WX-TO: WX Web Interface

WX TO Juniper NETWORKS

Device Setup Compression QoS Acceleration Monitor Admin Help Logged in as: admin Save Logout

Device Setup

Basic

- Addresses
- Interfaces
- Time
- License Key
- SNMP
- Syslog Server
- Local Routes
- Registration Server

AAA

Applications

Advanced

Local Routes

6 local routes are defined on this WX device.

IP Address	Subnet Mask	Gateway	Route Type	
0.0.0.0	0.0.0.0	200.100.179.27	Static	
127.0.0.1	0.0.0.0	127.0.0.1	Dynamic	
200.100.179.22	255.255.255.0	200.100.179.22	Static	DELETE
200.100.179.23	255.255.255.0	200.100.179.23	Static	DELETE
200.100.179.24	255.255.255.0	200.100.179.24	Static	DELETE
200.100.179.27	255.255.255.0	200.100.179.27	Dynamic	

Static routes take precedence over dynamic routes

Submit Static... Dynamic... Import... Router Balancing...

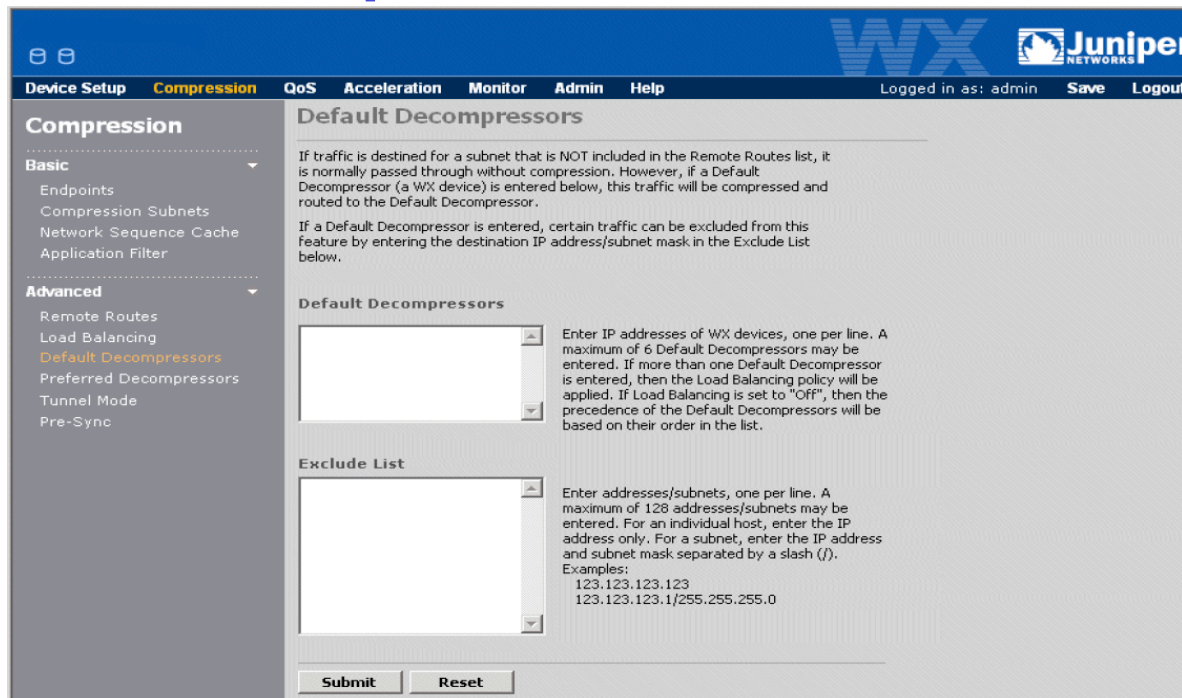
OSPF: Stopped

RIP: Stopped

Router Polling: None

https://200.100.179.27/local.htm 200.100.179.27

Default decompressor



Device Setup **Compression** QoS Acceleration Monitor Admin Help Logged in as: admin Save Logout

Compression

Basic

- Endpoints
- Compression Subnets
- Network Sequence Cache
- Application Filter

Advanced

- Remote Routes
- Load Balancing
- Default Decompressors**
- Preferred Decompressors
- Tunnel Mode
- Pre-Sync

Default Decompressors

If traffic is destined for a subnet that is NOT included in the Remote Routes list, it is normally passed through without compression. However, if a Default Decompressor (a WX device) is entered below, this traffic will be compressed and routed to the Default Decompressor.

If a Default Decompressor is entered, certain traffic can be excluded from this feature by entering the destination IP address/subnet mask in the Exclude List below.

Default Decompressors

Enter IP addresses of WX devices, one per line. A maximum of 6 Default Decompressors may be entered. If more than one Default Decompressor is entered, then the Load Balancing policy will be applied. If Load Balancing is set to "Off", then the precedence of the Default Decompressors will be based on their order in the list.

Exclude List

Enter addresses/subnets, one per line. A maximum of 128 addresses/subnets may be entered. For an individual host, enter the IP address only. For a subnet, enter the IP address and subnet mask separated by a slash (/).
Examples:
123.123.123.123
123.123.123.1/255.255.255.0

Submit Reset

“TO possui saída até DF. Se WX-TO elege WX-DF como 'default decompressor', todo tráfego pela rota default de TO para DF é comprimido e enviado para WX-DF.”

FBF para direcionar tráfego

```
[edit interfaces]
ge-0/0/0 {
  traps;
  vlan-tagging;
  ...
  unit 120 {
    description "JM10_DF - JM320_DF|200...IP_jm320";
    vlan-id 120;
    family inet {
      filter {
        input WXClassify_PoPTO_Tkt103605;
      }
      address 200...IP_JM10/30;
    }
    family inet6 {
      address 2001::IP6_JM10/64;
    }
  }
  unit 130 {
    description "JM10_DF - WX50-DF|200...IP_WXDF";
    vlan-id 130;
    family inet {
      address 200...IP_JM10'/30;
    }
  }
}
```

FBF para direcionar tráfego

```
[edit firewall]
filter WXClassify_PoPTO_Tkt103605 {
  term ID_PoPTO_Subnets_Tkt103605 {
    from {
      destination-address {
        200...REDE_TO/24;
        200...REDE_TO'/24;
        200...REDE_TO''/24;
        200...REDE_TO'''/24;
      }
    }
    then routing-instance RT_TBL_PoPTO_Tkt103605;
  }
  term default {
    then accept;
  }
}
```

FBF para direcionar tráfego

```
[edit routing-instances]
RT_TBL_PoPTO_Tkt103605 {
  description "Encaminha trafego destinado a PoP-TO para a caixa WX-50";
  instance-type forwarding;
  routing-options {
    static {
      route 0.0.0.0/0 next-hop 200...IP_WXDF;
    }
  }
}

[edit routing-options]
interface-routes {
  rib-group inet RT_PoPTO_FBFGROUP_Tkt103605;
}
rib-groups {
  RT_PoPTO_FBFGROUP_Tkt103605 {
    import-rib [ inet.0 RT_TBL_PoPTO_Tkt103605.inet.0 ];
  }
}
```

Problemas enfrentados

- Ausência de gigabit no compressor ofertado;
- Fator "elemento estranho" na rede;
- Direcionamento "blackhole": queda de energia;
- Multi-enlace: tráfego desbalanceado, latência, shaping.

Resultados

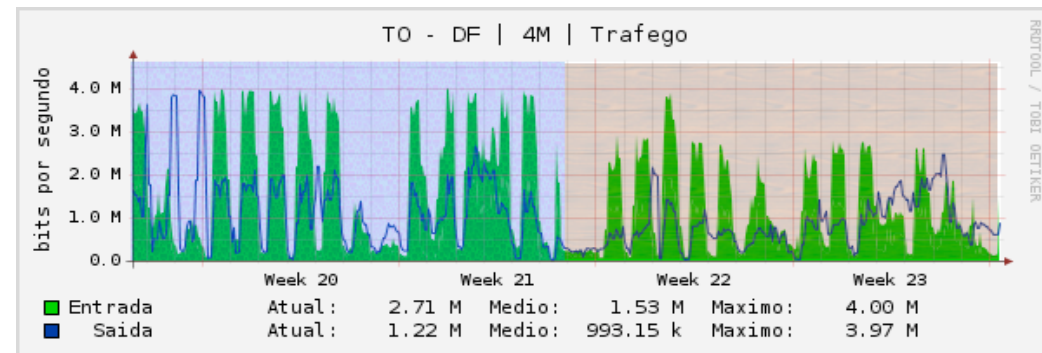
Média semanal de compressão

Sentido TO>Internet

- pico: 77,3%
- Total: 36,4%
- banda WAN efetiva: 1,57 X

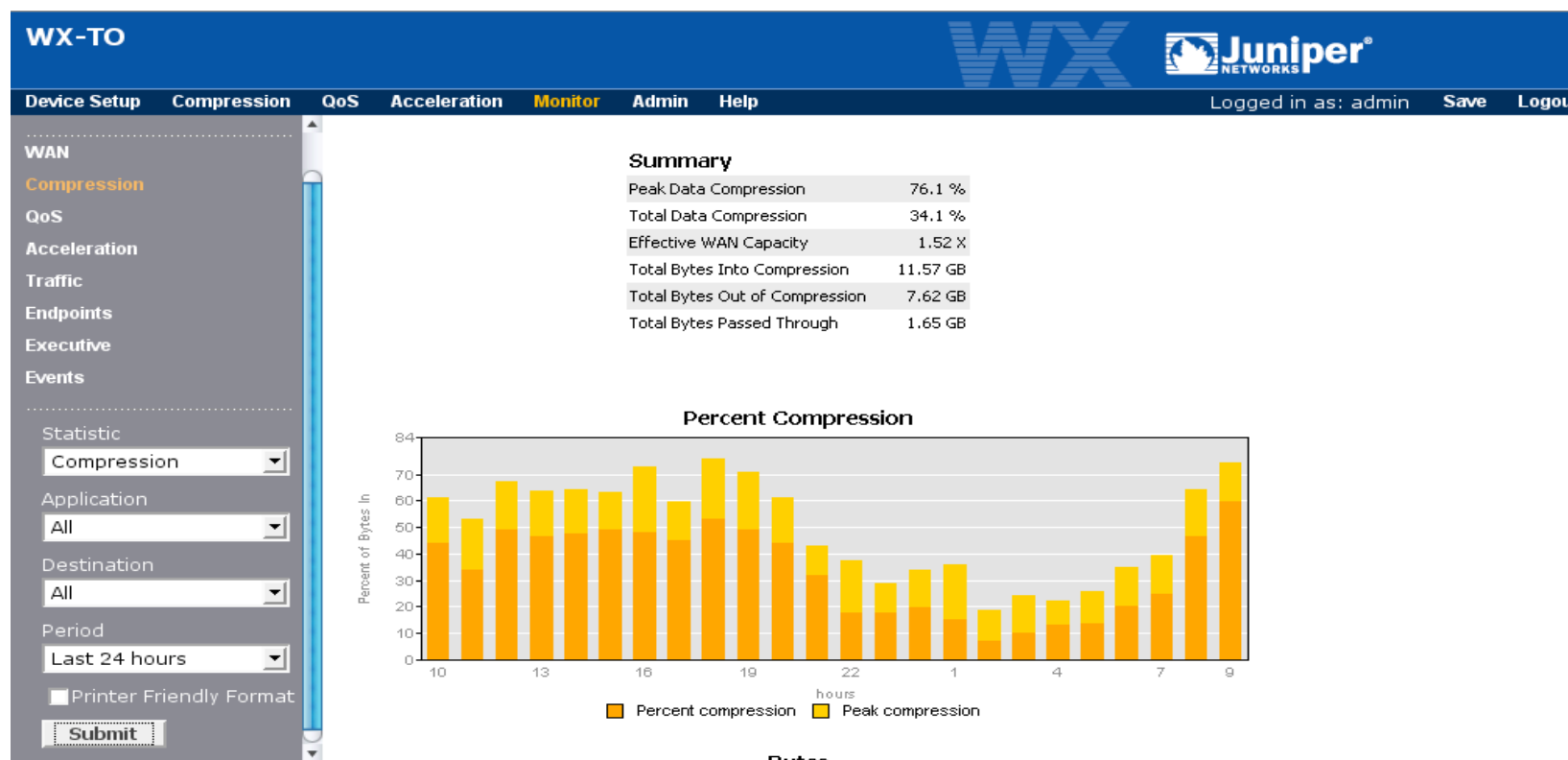
Sentido Internet>TO

- pico: 56.1%
- Total: 17,1%
- banda WAN efetiva: 1,21 X



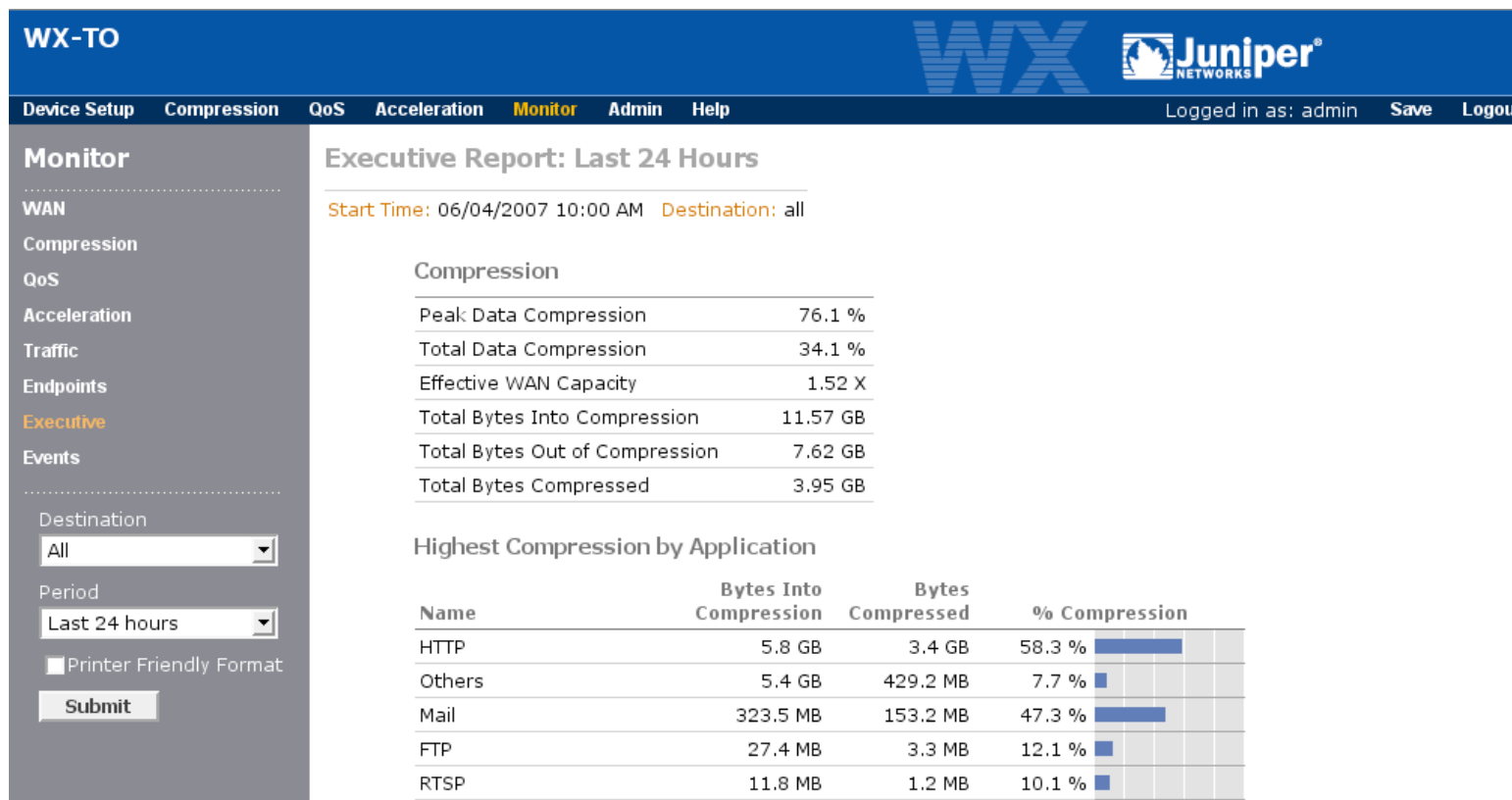
* protocolos comprimidos: HTTP, FTP, RSTP, RTP, Email para minimizar a latência.

Screenshots



Estatísticas de compressão das últimas 24 horas, site TO.

Screenshots



The screenshot displays the Juniper WX-TO Monitor interface. The main content area shows an "Executive Report: Last 24 Hours" for the destination "all", starting at 06/04/2007 10:00 AM. The report includes a "Compression" section with the following data:

Metric	Value
Peak Data Compression	76.1 %
Total Data Compression	34.1 %
Effective WAN Capacity	1.52 X
Total Bytes Into Compression	11.57 GB
Total Bytes Out of Compression	7.62 GB
Total Bytes Compressed	3.95 GB

Below this is a "Highest Compression by Application" table:

Name	Bytes Into Compression	Bytes Compressed	% Compression
HTTP	5.8 GB	3.4 GB	58.3 %
Others	5.4 GB	429.2 MB	7.7 %
Mail	323.5 MB	153.2 MB	47.3 %
FTP	27.4 MB	3.3 MB	12.1 %
RTSP	11.8 MB	1.2 MB	10.1 %

The interface also features a left-hand navigation menu with options like WAN, Compression, QoS, Acceleration, Traffic, Endpoints, Executive (selected), and Events. A control panel on the left allows filtering by destination (All) and period (Last 24 hours), with a "Submit" button.

Visão geral das últimas 24 horas, site TO.

That's it...



The End

Obrigado !!!