



Network Availability Data Publication

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Introduction

- ESnet is managing our circuit availability data.
 - To provide availability statistics to our management and user communities.
 - To help us identify trends and reoccurring problems.
 - To monitor our infrastructure providers for SLA/contract compliance.
 - To improve maintenance event scheduling and notifications.
- Our user communities could make effective use of this information.
 - LHC and other experiments will use complex sets of circuits across our networks to meet their requirements. Easy access to outage and maintenance events could greatly simplify debugging.
 - Our user communities are developing systems that assume the network is a schedulable resource. We need a standardized way to communicate when parts of the the network will be out of service or are currently experiencing problems.
- Maintaining and sharing this information in a standardized format could provide a valuable service to our user communities.
 - If we are all collecting similar information.
 - If non-technical barriers to publishing data can be overcome.
 - If other networks think it would be useful.

Use Cases

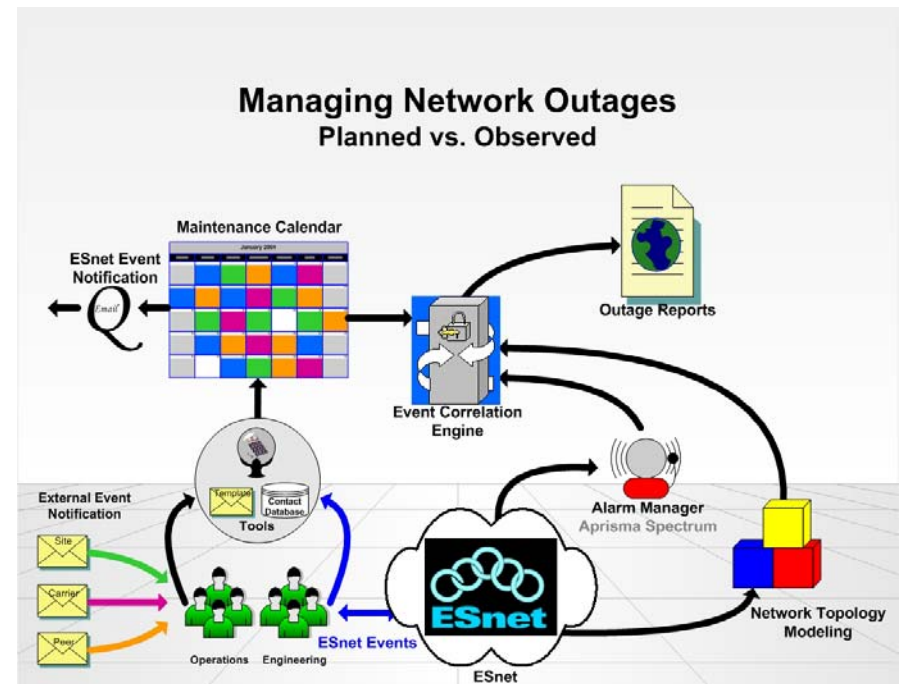
- A user is planning a large file transfer next week.
 - Will scheduled maintenance events affect him?
- A users application experiences a change in network performance
 - Submit the new and old paths to a web service to find:
 - Planned outages.
 - Un-scheduled outages.
 - Is the problem already under investigation?
 - Identify open trouble tickets across multiple domains.
- You are planning an outage for a link that carries high bandwidth LHC flows.
 - Is somebody else planning an outage on the backup circuits at the same time?
- Your NMS system just raised an alarm for a peer.
 - You can easily check to see if this is a scheduled event, or if they are already working on the problem.

What is Availability Data?

- Outage
 - Something that is observable by a Network Management System
 - IE. link failure, router/switch failure, etc.
 - Data
 - Start time
 - Duration
 - Device, Interface or Circuit affected.
- Event
 - Aggregation of one or more outages in space and time.
 - Planned or unplanned.
 - Associated with a trouble ticket and other meta-data.

ESnet Availability Management*

- A set of interdependent components.
 - Plan, schedule and track events.
 - Send notifications
 - Collect outage data recorded by NMS.
 - Correlate trouble tickets, outages and events
 - Produce Reports and Statistics



* The results of several years of effort by Mike O'Connor.

Network Reports View

<http://calendar.es.net/cgi-bin/pmcalendar.pl>

ESnet Planned Maintenance Calendar

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Email Queue

Reports

Summary View

SUN	MON	TUE	WED	THU	FRI	SAT
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
						■
<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>
						■
<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>
<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>
		■	■	■	■	
<u>27</u>	<u>28</u>					

■ ESnet
■ Site
■ Carrier
■ Peer

The ESnet maintenance calendar is a portal for information about network maintenance and outage events.

Day View



Day View

Monthly View

Daily View

Daily Outages

Daily Mail

New Event



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0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----

US Time Zones (24Hr)

PACIF	MNT	CENT	EAST	Location / TTS	Organization / Ticket
01:00	02:00	03:00	04:00	GAC, SNV 14243	Qwest Change Management 199335
14:30	15:30	16:30	17:30	ORNL, LAMONT 14253	AT&T AT&T - 5D1300046
15:30	16:30	17:30	18:30	ALB-HUB 14077	ESnet Qwest-200383

Event View



Event View

Monthly View

Event View

Outage View

Device View

Add. Email Msg.

Edit Event

Delete Event



[\[14243\]](#)-GAC<-OC3->SNV HUB - Qwest Maintenance 1/4

Start: Wed Jan 4 1:00:00 2006 (US/Pacific) Wed Jan 4 9:00:00 2006 (GMT)

End: Wed Jan 4 3:00:00 2006 (US/Pacific) Wed Jan 4 11:00:00 2006 (GMT)

Qwest Change Management **Planned**

Message Sent: Mon Jan 2 1:05:01 2006

Subject: [14243]-GAC<-OC3->SNV HUB - Qwest Maintenance 1/4

To: esnet-status@es.net

```
Begin: Wed Jan 4 1:00:00 2006 (US/Pacific)Wed Jan 4 9:00:00 2006 (GMT)
End: Wed Jan 4 3:00:00 2006 (US/Pacific)Wed Jan 4 11:00:00 2006 (GMT)
Location: GAC, SNV
```

This outage has been estimated to be 00(hrs) 15(min) within the above maintenance window

Description:

QWEST TICKET NUMBER: 199335

DESCRIPTION: Will affect the OC3 link between Sunnyvale, CA and General Atomics Corp(San Diego, CA).

REASON FOR MAINTENANCE: OC3 is being groomed to a new TWTC access Facility
Circuit ID: OC3C-7307696

Connectivity may be affected to:

This event will affect specific links to router ga-rt1.es.net.
Link gac-pos-snv.es.net

This event will affect specific links to router snv-cr1.es.net.
Link snv-pos-gac.es.net

Monthly Customer Service Reports

Service availability is measured along the path(s) from the customer site to the ESnet backbone.

Availability Report (US Pacific time)		LBL 2500	6/2004	Link to Calendar
Start Event	End Event		Duration	Detail
Mon Jun 7 7:09:18 2004	Mon Jun 7 7:49:00 2004		000:39:42 hhh:mm:ss	Event
Thu Jun 24 18:00:29 2004	Thu Jun 24 18:04:02 2004		000:03:33 hhh:mm:ss	Event
Summary				
Service availability	ESnet service outages	99.900% percent	ESnet service delivery percentage for the month	
Service event count		2 events		
Planned outage		000:03:33 hhh:mm:ss		
Unplanned outage		000:39:42 hhh:mm:ss		
Service outage time		000:43:15 hhh:mm:ss	Total outage duration for the month	
Site event count	Customer induced outages	0 events	Outages initiated by the customer.	
Site outage time		000:00:00 hhh:mm:ss		

The monthly customer service reports combine raw alarms into “customer outage events” and display **all** outages, even those not associated with a calendar event. The ESnet service percentage does not include Customer induced outages.

Email Templates

ESnet Outage Notification

[<TTS>]-<Title>

Begin: <Date> <GMT>

End: <End> <EndGMT>

Location: <Location>

This outage has been estimated to be <EOD-hour>(hrs) <EOD-min>(min)
within the above maintenance window

Description:
<description>

Affected Devices:
<affected>

ENERGY SCIENCES NETWORK (ESnet)

24x7 NOC (510)486-7607 Email: trouble@es.net <http://www.es.net>

There are some challenges.

- Typical NMS systems generate excessive alarms and traps. Filtering these to identify root causes can be challenging.
- Automated correlation of Traps and Alarms with Trouble Tickets may require changes to Trouble Ticket systems and processes.

Next Steps

- Are other networks managing availability data?
- Can data publication barriers be overcome?
- Is it worth doing?