



Peregrine: Web-enhanced Antelope

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BRTT

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Peregrine

- Antelope Base System + Web Infrastructure
 - New program *rtwebserver*
 - New program *rtcachel*
 - Host of supporting python libraries

Peregrine

- Web-based Monitoring
- Web-based Information distribution
- Web-based Interaction

Peregrine

- Python-based web server
- Along with the various python extensions, provides a comprehensive toolkit for developing custom web servers that are highly integrated into the Antelope environment (configuration, connectivity, etc.)
- Along with other components, will be sold as a separate BRTT product or as an addon to existing Antelope site licenses
- A demo version of the complete ***Peregrine*** product will be made available on request

Peregrine Goals

- Robust Web Presence for users and operators
- Capitalize on informative power of real-time system
- Platform for revealing more about RT system to operators
- Clean integration with real-time system
- Familiar configuration patterns for operators
- Low user-maintenance cost and complexity
- Flexible and Extensible
- Self-contained
- Maintainable software base

What We Did

- Wrote our own web server
- Made it run under a real-time system (rtexec)
- Made it look and feel like our existing programs
- Made it connect easily to Antelope
- Wrote a caching daemon to generate products for it

Why not Existing Technologies?

- E.g. operator-managed Apache?
- And open-source PHP?
- And hand-linked Python?
- And user-compiled ImageMagick?
- And consultant-developed custom apps?

Why not Existing Technologies?

- One Simple Reason:
 - It hasn't worked in commercial context
 - (works for a few places with advanced development staff and strong sysadmin resources)
 - Hasn't provided generally accessible platform
- Apache installations are highly variable
- Linking in buzzword technologies is complex
- Configurable elements are heterogeneous
- Underlying open-source is constantly changing
- High cost of ownership, high cost of development

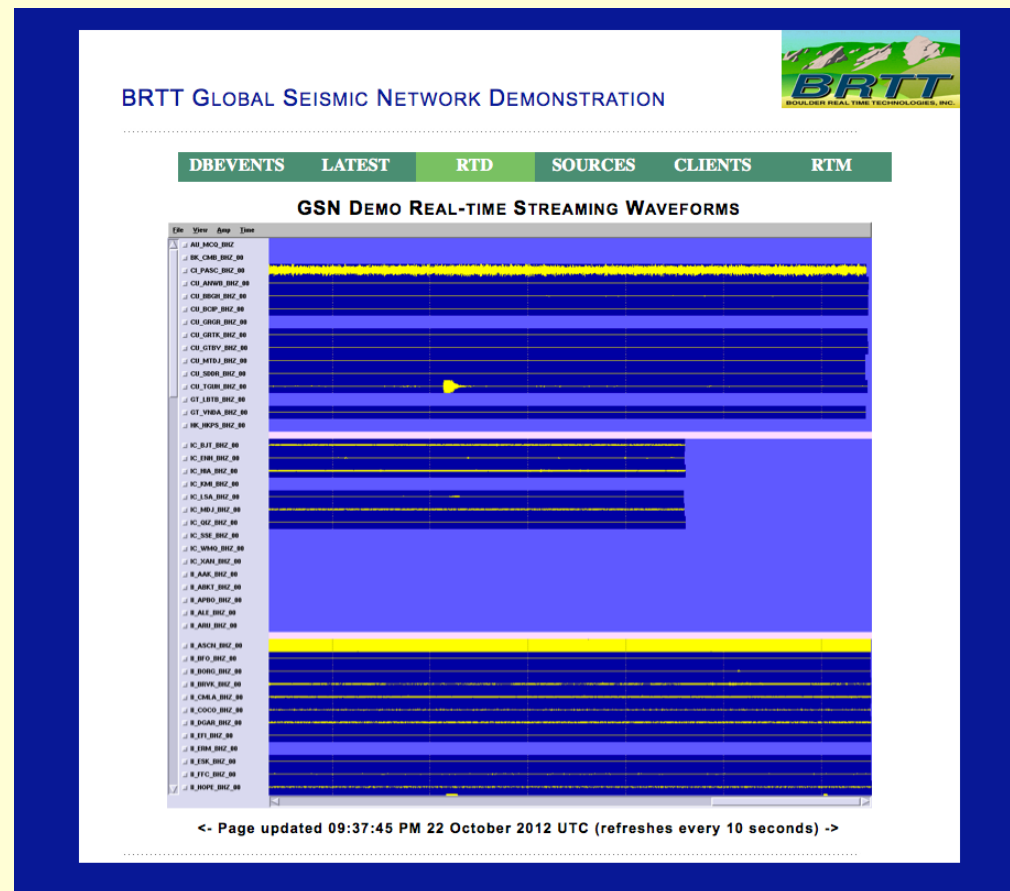
Why not distribute an existing stack?

- Lots of work; worth doing right
- We can create something better tuned for our users
- Ours is fully self-contained
- Ours is maintainable by us
- Actually we did start with an existing stack:
 - Python
 - Twisted Web Platform

Summary --

- Hard to maintain what we don't control
- Hard to support what we haven't built
- Hard to come up with strategies to integrate our apps with organic free-for-all code base
 - Much less explain those strategies...
- (“Hard” => “Very Expensive”)


Peregrine Example: *orbmonrtd* on the web



Peregrine Example: *dbevents* on the Web

For
Users
And
Operators

BRTT GLOBAL SEISMIC NETWORK DEMONSTRATION



DBEVENTS LATEST RTD SOURCES CLIENTS RTM

RECENT EARTHQUAKES FROM GSN DEMO

data	time R	mb	mag	no	refid	region
20121022093650.00000000	1411110	2.0		15	PHILIPPINES	PHILIPPINES
20121022093650.00000000	1411110	2.0		16	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		17	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		18	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		19	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		20	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		21	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		22	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		23	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		24	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		25	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		26	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		27	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		28	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		29	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		30	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		31	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		32	INDONESIA	INDONESIA
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20121022093650.00000000	1411110	2.0		34	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		35	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		36	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		37	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		38	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		39	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		40	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		41	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		42	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		43	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		44	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		45	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		46	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		47	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		48	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		49	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		50	INDONESIA	INDONESIA
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20121022093650.00000000	1411110	2.0		53	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		54	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		55	INDONESIA	INDONESIA
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20121022093650.00000000	1411110	2.0		57	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		58	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		59	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		60	INDONESIA	INDONESIA
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20121022093650.00000000	1411110	2.0		64	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		65	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		66	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		67	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		68	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		69	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		70	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		71	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		72	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		73	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		74	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		75	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		76	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		77	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		78	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		79	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		80	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		81	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		82	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		83	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		84	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		85	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		86	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		87	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		88	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		89	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		90	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		91	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		92	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		93	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		94	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		95	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		96	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		97	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		98	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		99	INDONESIA	INDONESIA
20121022093650.00000000	1411110	2.0		100	INDONESIA	INDONESIA

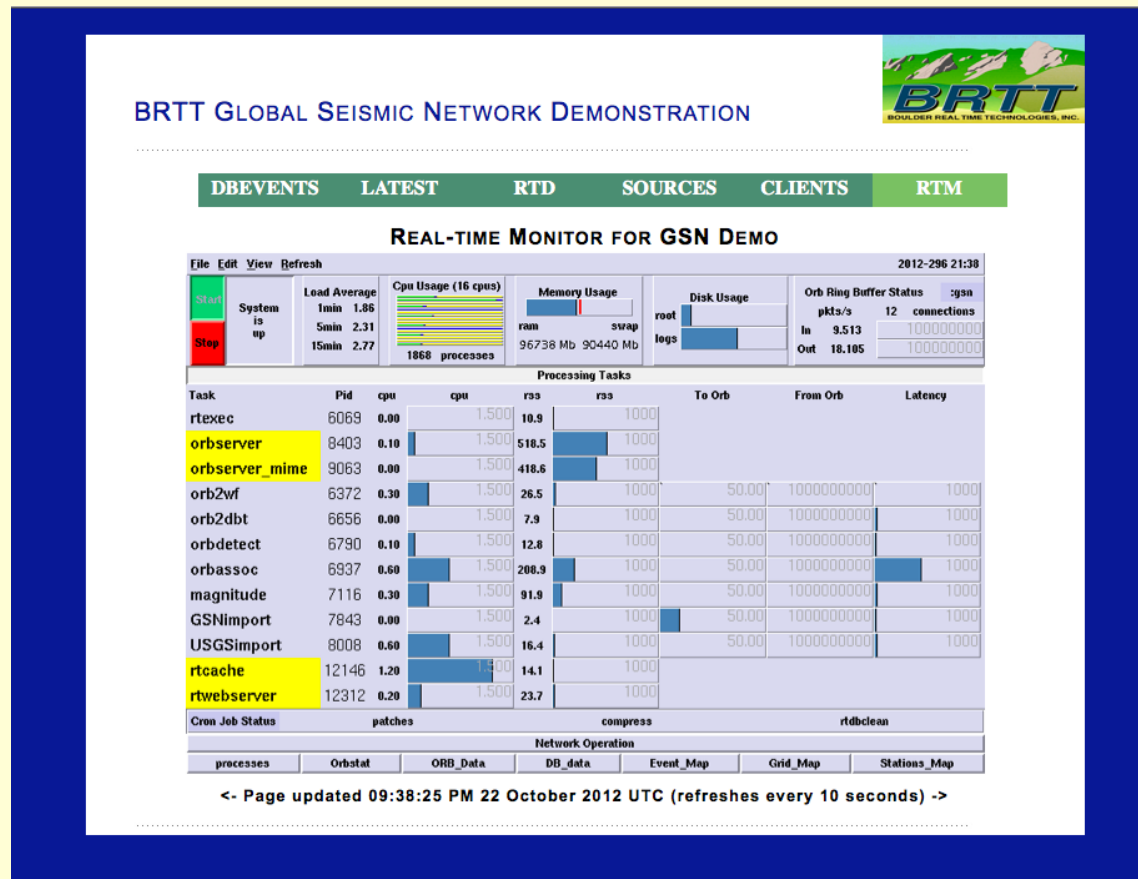
Map showing recent earthquakes from the GSN Demo. The map displays the Pacific region with red lines indicating seismic activity. A table on the right lists earthquake data including time, magnitude, and region.

Map: Time: 20121022(09:36:50) 21:36:50 GMT, 03:34:00 since last update, 09:36:25 since last event

<- Page updated 09:36:50 PM 22 October 2012 UTC (refreshes every 10 seconds) ->

Peregrine Example: RTM on the Web

For
Operators



Peregrine: What's the difference?

- No ImageMagick! (whew)
- No Installation sysadmin of open-source code
- No Configuration sysadmin of 3rd party code
- Little or no custom development
- Much more plug-n-play
- Generalized Platform, Streamlined Tools
 - Custom development still possible!

Peregrine: What's the difference?

- Single command-lines to launch programs
- Entirely contained within rtextec system
- Parameter-file configured
- Python modules included to provide capabilities

rtwebserver

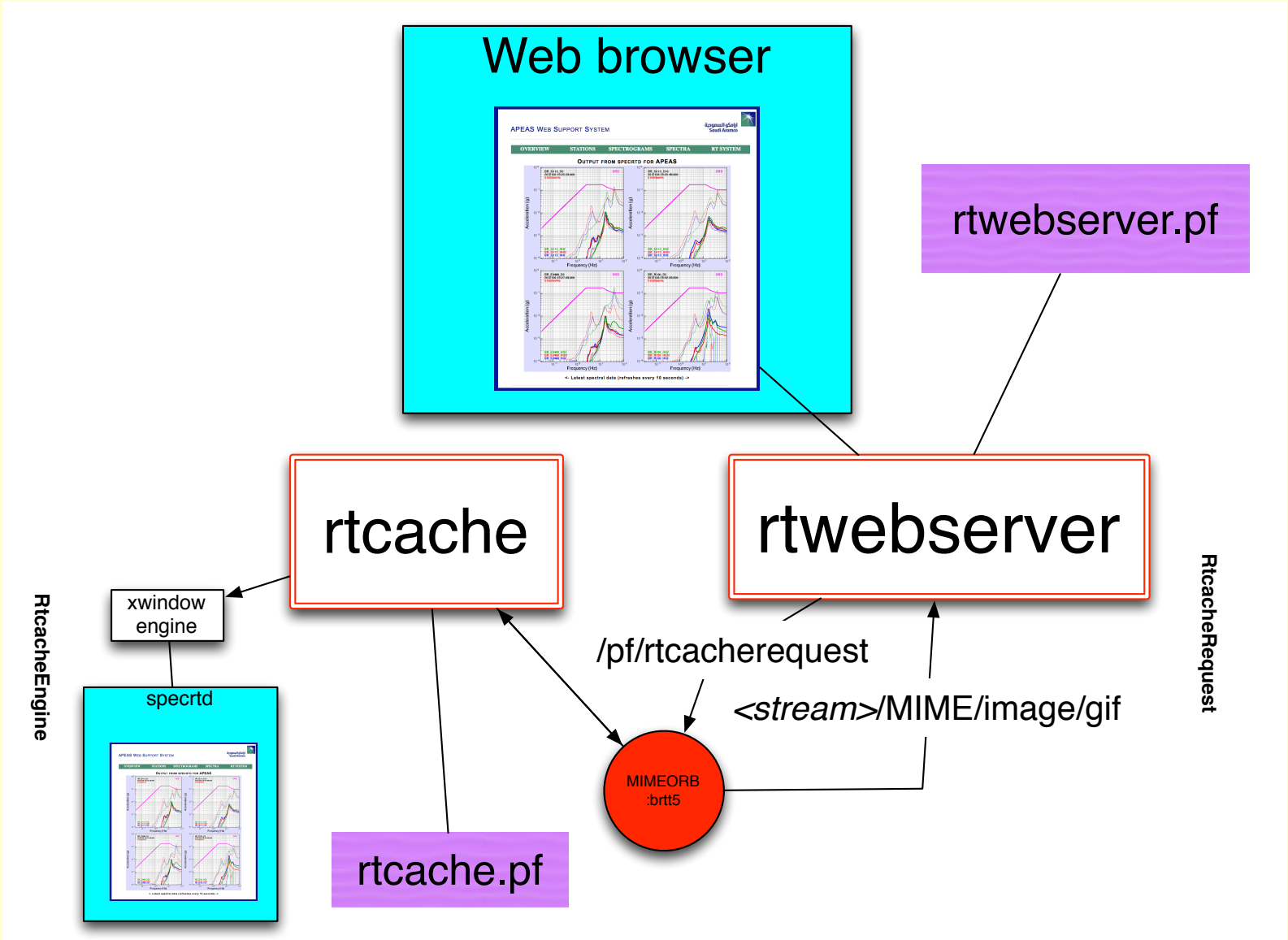
- Self-contained web-server

```
% rtwebserver -v -P 8000
```

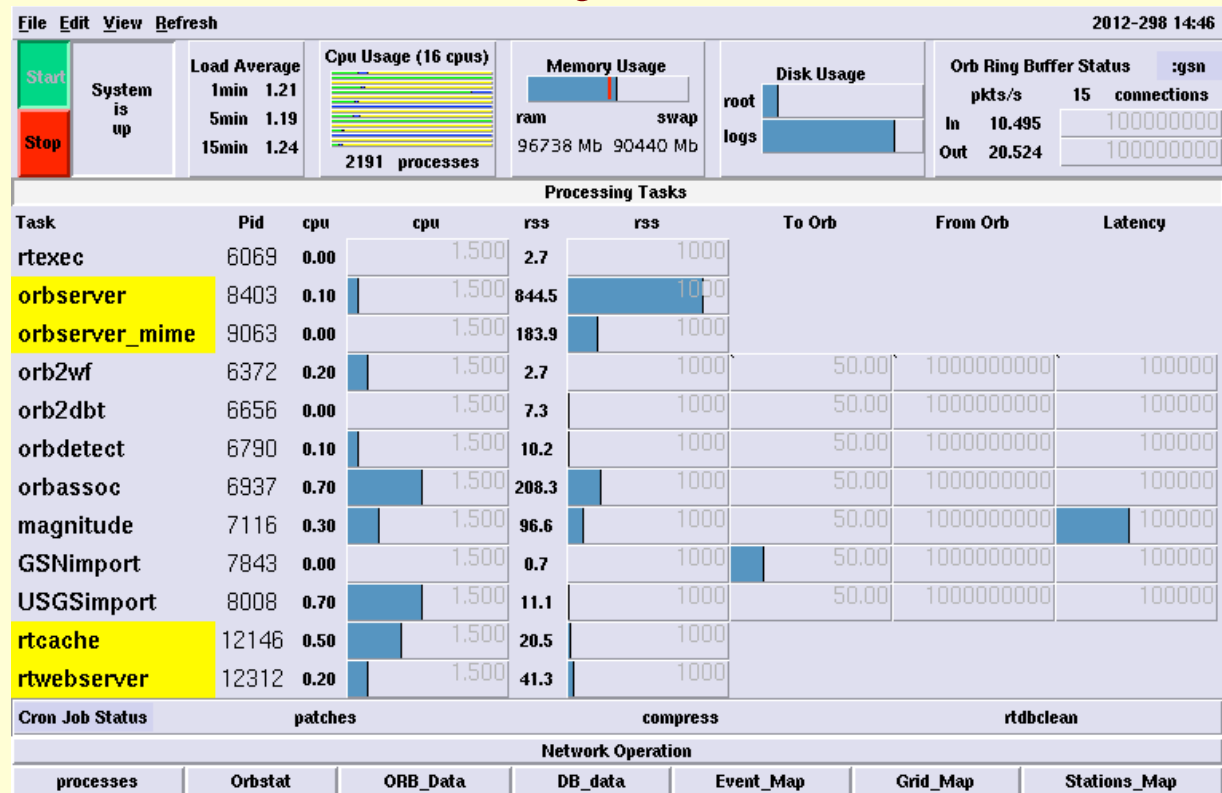
- Runs under rtextec
- Parameter-file configures entire site
 - *rtwebserver.pf*
- Logs connections to database
- Python and Twisted (<http://twistedmatrix.com>)

rtcache

- Generalized Caching Daemon
- Pre-builds products for the web server
- E.g.:
 - Dynamic X-window screen-shots
 - Strong-motion alarm reports
 - Anything you can code into Python
- Exchanges request/response via orbserver
- Can show on the web any GUI you can run as X-client



Rtwebserver / rtcache in real-time system



rtwebserver.pf

```
site &Arr{
  pages &Arr{
    index          rpy:webitems/index.rpy  index
    latest         rpy:webitems/latest.rpy
    rtm            rpy:webitems/rtm.rpy
    orbmonrtd     rpy:webitems/orbmonrtd.rpy
    sources       rpy:webitems/sources.rpy
    clients       rpy:webitems/clients.rpy
    dynamic &Arr{
      ximage      rtcache:ximage
    }
    images &Arr{
      brtt_logo.gif  file:webitems/images/brtt_logo.gif
      dots.gif       file:webitems/images/dots.gif
    }
    css &Arr{
      style.css     pf:stylesheet  text/css
    }
  }
}
```

rtwebserver page types

- file
- pf
- rpy
- rtcache
- (revproxy)

rtwebserver.pf

```
site &Arr{
  siteconfig &Arr{
    time_format           %I:%M:%S %p %d %B %Y %Z
    centerimage_width    640
    refresh_sec           10
  }
  ximage &Arr{
    orbname               :gsn2
    diagnostics           1
    maxwait_sec           5.0
    rtcache_targetname
  }
  phrases &Arr{
    header &Literal{
      <div id="header">
        <span class="private"></span>
        <p id="banner">BRTT Global Seismic Network Demonstration</p>
      </div>
      
    }
  }
}
```

rtwebserver.pf

```
site &Arr{
  stylesheet &Literal{

    html, body {
      background: #0c2093 ;
      margin: 0px ;
      padding: 0px ;
    }

    h1 {
      color: #000 ;
      font-family: arial, helvetica, geneva, sans-serif ;
      font-size: 1.3em ;
      margin: 2px ;
      margin-top: 20px ;
      font-variant: small-caps ;
      letter-spacing: 1px ;
      text-align: center ;
    }
  }
}
```

rtcache.pf

```

caches &Arr{
  defaults &Arr{
    enginetype xwindow
    command_env &Arr{
      PATH      &env(PATH)
      ANTELOPE   &env(ANTELOPE)
      PFPATH     &env(PFPATH)
    }
    image_format GIF
    window_name
    virtual_display auto
    virtual_screen_geometry 1280x1024
    startup_sleep_sec 0.2
    xwindow_restart_sec 86400
  }
  rtm &Arr{
    command rtm
  }
  dbevents &Arr{
    command dbevents db/gsn
  }
  orbmonrtd &Arr{
    command orbmonrtd :gsn -wmax 1200 -hmax 1000
  }
}

```


Peregrine Development Successes

- Easy display of generic X clients
- rtdemo_gsn web display
- Bighorn Web interaction platform

Easy display of generic X clients

BRTT GLOBAL SEISMIC NETWORK DEMONSTRATION

DBEVENTS LATEST RTD SOURCES CLIENTS RTM

GSN Demo ORB CLIENTS

File Refresh

Sort Matching

Thread

Writers

thr	kexec	pkt/s	kb/s command
47	0.0	0.000	0.000 orbdetect -v -onlypicks -out :gsm@ :gsm@
43	0.1	0.039	0.013 /datagen1
14	34.2	10.660	5.184 orb2orb bbarrey:gsm@ :gsm@ == @pf/genList

Readers

thr	kexec	pkt/s	kb/s command
1181	0.0	0.000	0.000 orbbasec -v -select /db/detection :gsm@
1180	0.1	0.027	0.018 orb2dbt -v -markagedone M -state state/
1179	0.1	0.027	0.018 orbvproc -v -state state/orbvproc -dbw
649	0.0	0.000	0.000 tkvstatat :gsm
648	0.0	0.000	0.000 tkvstatat :gsm
647	0.0	0.000	0.000 rta --
646	31.3	9.767	4.796 orbstatrd
15	34.2	10.679	5.197 orbdetect -v -onlypicks -out :gsm@ :gsm@
10	0.0	0.000	0.000 rta --

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BRTT GLOBAL SEISMIC NETWORK DEMONSTRATION

DBEVENTS LATEST RTD SOURCES CLIENTS RTM

GSN Demo ORB SOURCES

File Refresh

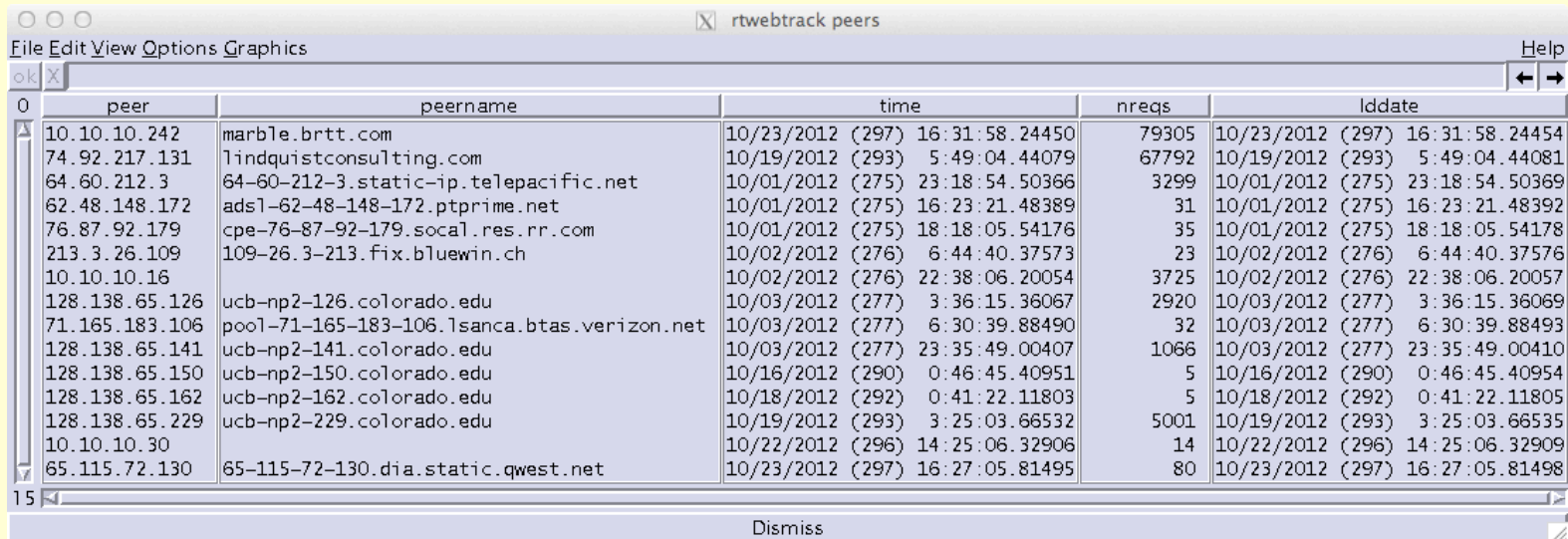
Sort Matching

Latency

srccname	kpkt	Mbytes	oldest	newest	latency
II_KAPI_LAR_00/GENC	1.178	0.445	274-17:29	277-23:57	18 days 21.6 hours
II_PWD_LAR_00/LISS	1.241	0.720	274-17:28	288-05:31	10 days 15.7 hours
II_AMO_LAR_00/GENC	19.384	10.409	274-17:32	286-05:57	10 days 15.6 hours
II_AMO_LAR_00/GENC	1.545	0.595	274-17:30	291-02:12	5 days 19.4 hours
II_AMO_LAR_00/GENC	27.112	6.853	274-17:32	291-02:18	5 days 19.3 hours
II_FUR1_LAR_00/LISS	0.165	0.089	289-20:17	291-02:59	5 days 18.6 hours
II_FUR1_LAR_00/LISS	2.196	1.179	289-05:08	291-03:09	5 days 18.4 hours
II_TSMN_LAR_00/LISS	6.136	3.295	274-17:29	292-00:36	4 days 21.0 hours
II_AMFO_LAR_00/LISS	3.257	1.749	274-17:31	296-11:45	9:53 hours
II_AMFO_LAR_00/LISS	46.133	24.773	274-17:32	296-11:51	9:46 hours
/pf/rxhmag	0.181	0.105	274-17:33	296-13:11	8:26 hours
CU_LARTR_LAR_00/SEED	95.746	50.362	274-17:31	296-13:40	7:57 hours
CU_GNDR_LAR_00/SEED	26.938	14.169	274-17:32	296-16:55	4:43 hours
II_TMOA_LAR_00/LISS	4.265	2.290	274-17:29	296-17:12	4:25 hours
II_TMOA_LAR_00/LISS	45.410	24.385	274-17:32	296-17:17	4:20 hours
II_TLV_LAR_00/GENC	3.417	1.276	272-21:42	296-18:24	3:13 hours
II_TLV_LAR_00/GENC	69.622	14.784	272-21:44	296-18:30	3:08 hours
II_KWRK_LAR_00/GENC	3.924	1.475	274-17:31	296-20:23	1:14 hours
II_KWRK_LAR_00/GENC	78.486	23.595	274-17:32	296-20:29	1:08 hours
IC_BUT_LAR_00/LISS	4.967	2.452	274-17:01	296-21:01	36:16 minutes
IC_HIA_LAR_00/LISS	4.539	2.437	274-17:00	296-21:01	36:13 minutes
IC_HRA_LAR_00/LISS	4.941	2.439	274-17:00	296-21:01	36:03 minutes
IC_MWJ_LAR_00/LISS	4.564	2.451	274-17:01	296-21:02	35:47 minutes
IC_QIE_LAR_00/LISS	4.639	2.491	274-17:02	296-21:03	34:41 minutes
IC_LSA_LAR_00/LISS	4.355	2.339	274-17:00	296-21:04	33:17 minutes
IC_HIA_LAR_00/LISS	52.187	28.024	274-17:04	296-21:08	29:11 minutes
IC_LAR_LAR_00/LISS	52.001	27.925	274-17:04	296-21:08	29:07 minutes
IC_HRA_LAR_00/LISS	49.956	26.826	274-17:04	296-21:08	29:03 minutes
IC_MWJ_LAR_00/LISS	50.121	26.915	274-17:04	296-21:08	29:01 minutes
IC_BUT_LAR_00/LISS	45.795	24.592	274-17:04	296-21:09	28:57 minutes
IC_QIE_LAR_00/LISS	89.087	47.840	274-17:04	296-21:09	28:52 minutes
II_HBRN_LAR_00/LISS	1.317	0.707	274-17:29	296-21:13	24:04 minutes
II_HLSB_LAR_00/LISS	4.754	2.553	274-10:10	296-21:23	14:46 minutes
II_HMO_LAR_00/LISS	1.418	0.741	274-17:27	296-21:28	12:15 minutes
II_SAMG_LAR_00/LISS	3.025	1.624	274-16:28	296-21:27	10:11 minutes

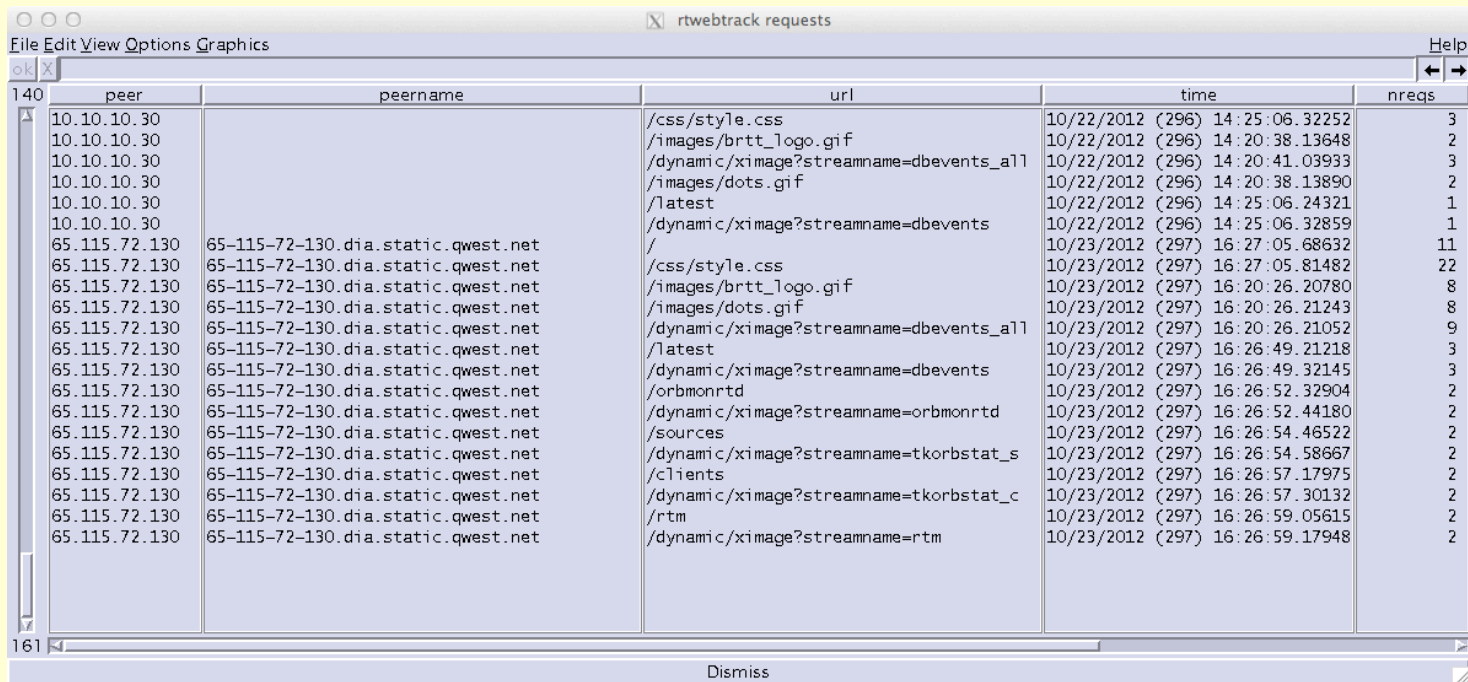
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rtwebserver connection logging



peer	peername	time	nreqs	lddate
10.10.10.242	marble.brtt.com	10/23/2012 (297) 16:31:58.24450	79305	10/23/2012 (297) 16:31:58.24454
74.92.217.131	lindquistconsulting.com	10/19/2012 (293) 5:49:04.44079	67792	10/19/2012 (293) 5:49:04.44081
64.60.212.3	64-60-212-3.static-ip.telepacific.net	10/01/2012 (275) 23:18:54.50366	3299	10/01/2012 (275) 23:18:54.50369
62.48.148.172	ads1-62-48-148-172.ptprime.net	10/01/2012 (275) 16:23:21.48389	31	10/01/2012 (275) 16:23:21.48392
76.87.92.179	cpe-76-87-92-179.socal.res.rr.com	10/01/2012 (275) 18:18:05.54176	35	10/01/2012 (275) 18:18:05.54178
213.3.26.109	109-26.3-213.fix.bluewin.ch	10/02/2012 (276) 6:44:40.37573	23	10/02/2012 (276) 6:44:40.37576
10.10.10.16		10/02/2012 (276) 22:38:06.20054	3725	10/02/2012 (276) 22:38:06.20057
128.138.65.126	ucb-np2-126.colorado.edu	10/03/2012 (277) 3:36:15.36067	2920	10/03/2012 (277) 3:36:15.36069
71.165.183.106	pool-71-165-183-106.lsanca.btas.verizon.net	10/03/2012 (277) 6:30:39.88490	32	10/03/2012 (277) 6:30:39.88493
128.138.65.141	ucb-np2-141.colorado.edu	10/03/2012 (277) 23:35:49.00407	1066	10/03/2012 (277) 23:35:49.00410
128.138.65.150	ucb-np2-150.colorado.edu	10/16/2012 (290) 0:46:45.40951	5	10/16/2012 (290) 0:46:45.40954
128.138.65.162	ucb-np2-162.colorado.edu	10/18/2012 (292) 0:41:22.11803	5	10/18/2012 (292) 0:41:22.11805
128.138.65.229	ucb-np2-229.colorado.edu	10/19/2012 (293) 3:25:03.66532	5001	10/19/2012 (293) 3:25:03.66535
10.10.10.30		10/22/2012 (296) 14:25:06.32906	14	10/22/2012 (296) 14:25:06.32909
65.115.72.130	65-115-72-130.dia.static.qwest.net	10/23/2012 (297) 16:27:05.81495	80	10/23/2012 (297) 16:27:05.81498

rtwebserver connection logging



The screenshot shows a web browser window titled "rtwebtrack requests" with a table of connection logs. The table has five columns: peer, peername, url, time, and nreqs. The data is organized into two groups: one for peer 10.10.10.30 and another for peer 65.115.72.130. The time column shows requests from 10/22/2012 and 10/23/2012. The nreqs column indicates the number of requests for each entry.

peer	peername	url	time	nreqs
10.10.10.30		/css/style.css	10/22/2012 (296) 14:25:06.32252	3
10.10.10.30		/images/brtt_logo.gif	10/22/2012 (296) 14:20:38.13648	2
10.10.10.30		/dynamic/ximage?streamname=dbevents_all	10/22/2012 (296) 14:20:41.03933	3
10.10.10.30		/images/dots.gif	10/22/2012 (296) 14:20:38.13890	2
10.10.10.30		/latest	10/22/2012 (296) 14:25:06.24321	1
10.10.10.30		/dynamic/ximage?streamname=dbevents	10/22/2012 (296) 14:25:06.32859	1
65.115.72.130	65-115-72-130.dia.static.qwest.net	/	10/23/2012 (297) 16:27:05.68632	11
65.115.72.130	65-115-72-130.dia.static.qwest.net	/css/style.css	10/23/2012 (297) 16:27:05.81482	22
65.115.72.130	65-115-72-130.dia.static.qwest.net	/images/brtt_logo.gif	10/23/2012 (297) 16:20:26.20780	8
65.115.72.130	65-115-72-130.dia.static.qwest.net	/images/dots.gif	10/23/2012 (297) 16:20:26.21243	8
65.115.72.130	65-115-72-130.dia.static.qwest.net	/dynamic/ximage?streamname=dbevents_all	10/23/2012 (297) 16:20:26.21052	9
65.115.72.130	65-115-72-130.dia.static.qwest.net	/latest	10/23/2012 (297) 16:26:49.21218	3
65.115.72.130	65-115-72-130.dia.static.qwest.net	/dynamic/ximage?streamname=dbevents	10/23/2012 (297) 16:26:49.32145	3
65.115.72.130	65-115-72-130.dia.static.qwest.net	/orbmonrtd	10/23/2012 (297) 16:26:52.32904	2
65.115.72.130	65-115-72-130.dia.static.qwest.net	/dynamic/ximage?streamname=orbmonrtd	10/23/2012 (297) 16:26:52.44180	2
65.115.72.130	65-115-72-130.dia.static.qwest.net	/sources	10/23/2012 (297) 16:26:54.46522	2
65.115.72.130	65-115-72-130.dia.static.qwest.net	/dynamic/ximage?streamname=tkorbstat_s	10/23/2012 (297) 16:26:54.58667	2
65.115.72.130	65-115-72-130.dia.static.qwest.net	/clients	10/23/2012 (297) 16:26:57.17975	2
65.115.72.130	65-115-72-130.dia.static.qwest.net	/dynamic/ximage?streamname=tkorbstat_c	10/23/2012 (297) 16:26:57.30132	2
65.115.72.130	65-115-72-130.dia.static.qwest.net	/rtm	10/23/2012 (297) 16:26:59.05615	2
65.115.72.130	65-115-72-130.dia.static.qwest.net	/dynamic/ximage?streamname=rtm	10/23/2012 (297) 16:26:59.17948	2

Peregrine Future

- Web sockets
- Interaction
- More applications
 - (Wish list?)

Thank You

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