

### Peregrine: Web-enhanced Antelope





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BRTT

Papagayo, Costa Rica AUG

# Peregrine

- Web-based Monitoring
- Web-based Information distribution
- Web-based Interaction
- Antelope Base System + Web Infrastructure
  - New program *rtwebserver*
  - New program *rtcache*
  - Host of supporting python libraries



# 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

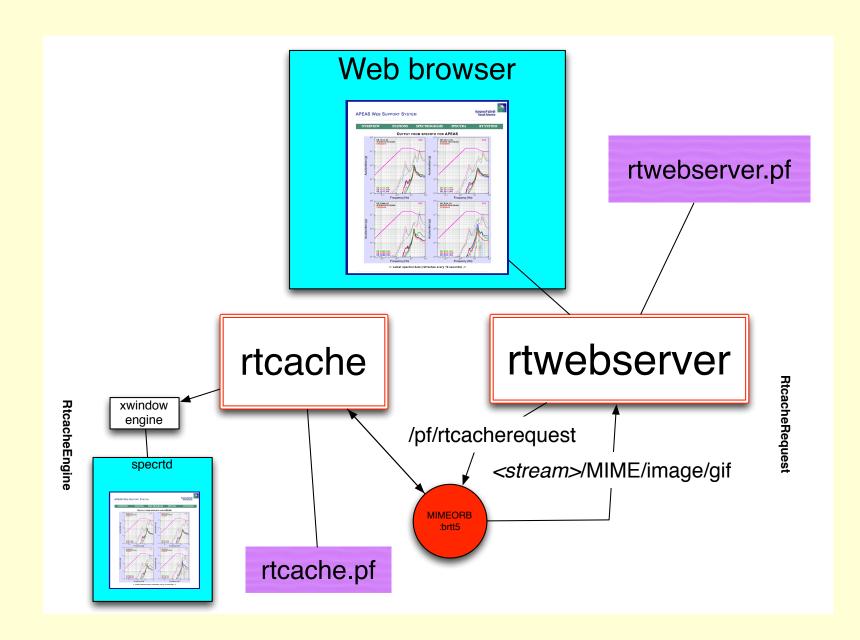


### *rtwebserver / rtcache* in real-time system

<u>File Edit V</u> iew <u>R</u> efre	esh						2012-298 14:46
Start System is up	Load Average 1min 1.21 5min 1.19 15min 1.24	Cpu Usage (16 cpus)	ram	bry Usage swap b 90440 Mb	Disk Usage root logs	Orb Ring Buff pkts/s In 10.495 Out 20.524	er Status :gsn 15 connections 100000001
				ssing Tasks			
Task	Pid cy	1.500	rss	rss 1000	To Orb	From Orb	Latency
rtexec	6069 <b>0</b> .	.00 1.500		1000			
orbserver	8403 <b>0</b> .	.10 1.500	844.5	1000	]		
orbserver_mime	9063 <b>0</b> .	.00 1.500	183.9	1000			
orb2wf	6372 <b>0</b> .	.20 1.500	2.7	1000	) 50.00	1000000000	100000
orb2dbt	6656 <b>0</b> .	.00 1.500	7.3	1000	50.00	1000000000	100000
orbdetect	6790 <b>o</b> .	.10 1.500	10.2	1000	50.00	1000000000	100000
orbassoc	6937 <b>0</b> .	.70 1.500	208.3	1000	50.00	1000000000	100000
magnitude	7116 <b>o</b> .	.30 1.500	96.6	1000	50.00	1000000000	100000
GSNimport	7843 <b>o</b> .	.00 1.500	0.7	1000	50.00	1000000000	100000
USGSimport	8008 <b>o</b> .	.70 1.500	11.1	1000	50.00	1000000000	100000
rtcache	12146 <b>o</b> .	.50 1.500	20.5	1000		,	
rtwebserver	12312 <b>0</b> .	.20 1.500	41.3	1000	วี		
Cron Job Status	pat	tches		compress		rtdbcle	an
			Netwo	rk Operation			
processes	Orbstat	ORB_Data	DB_	dataI	Event_Map	Grid_Map	Stations_Map



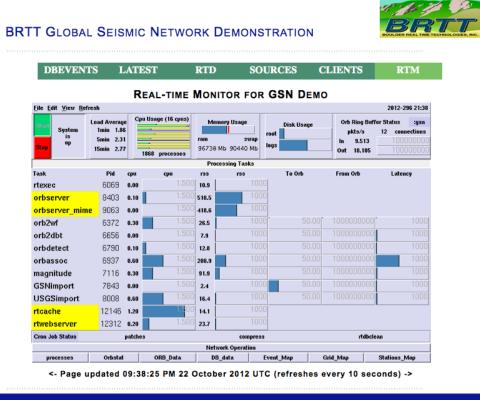
BRTT





### Peregrine Example: *RTM* on the Web

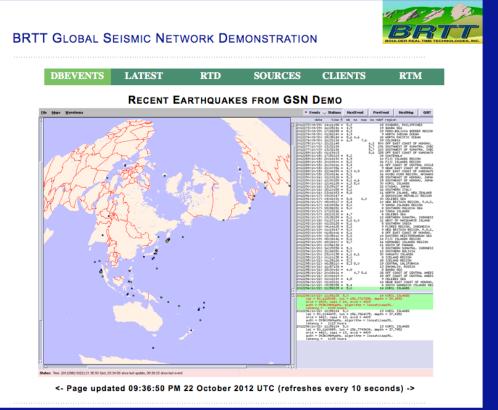
#### For Operators





### Peregrine Example: *dbevents* on the Web

For Users And Operators





# Easy display of generic X clients

DBEVENTS	LATEST	RTD	SOURCES	CLIENTS	RTM						
	G	SN DEMO C	ORB CLIENTS								
File Refresh		🕹 General 🔶 Clients -			Help						
	Sort	Matching	o sturtes o Patiets								
	thread	- 1									St for a
0 Vriters											BA
thr %exec pk	t/s kb/s comma	nd		BI	RTT GLOBAL S	EISMIC NETW	ORK D	EMONSTRA	TION		BOULDER REAL TIME
47 0.0 0.	000 0.000 orbde 019 0.013 /Data	tect -v -onlypic	ks -out :gsn8 :gsn8								
14 34.2 10.			gsn@ -m @pf/gsnlist		DBEVENTS	LATEST	RTD	SOURC	ES	CLIENTS	RTM
Readers											
	kt/s kb/s command .000 0.000 orbassoc -v -select /db/detection :gsm	De/detection (amp) (			GSN	DEMO	ORB SOURC	ES			
1180 0.1 0.	027 0.018 orb2d	lbt -v -markmagsde	one M -state state/o		File Refresh						Help
1179 0.1 0.027 0.018 orbevproc -v -state 649 0.0 0.000 0.000 tkorbstat :gsn	stat :gsn	tate/orbevproc -dbwf			*		its 🔶 Sources 😔 Packet				
	000 0.000 tkorb 000 0.000 rtm -					Sort latency	Matching		×		
	767 4.796 orbmo	nrtd			scoare	kpkt		oldest	nevest	latency	E.
	679 5.197 orbde 000 0.000 rtm -		ts -out :gan@ :gan@		II_KAPI_LHZ_00/GENC IU PMG LMZ 00/LISS	1.1	8 0.445	274-17:29 2	77-23:57	18 days 21. 10 days 15.	6 hours
					IU PMG BHZ 00/LISS	19.3	4 10.409	274-17:32 2	86-05:57	10 days 15.	6 hours
					II_ARU_LHZ_00/GENC II_ARU_BHZ_00/GENC	1.54			91-02:12 91-02:18	5 days 19.4 5 days 19.3	
					IU_FURI_LHZ_00/LISS IU_FURI_BHZ_00/LISS	0.10	5 0.089	289-20:17 2	91-02:59 91-03:09	5 days 18.6 5 days 18.4	hours
					IU_TSUM_LHZ_00/LISS	6.1:	6 3.295	274-17:29 2	92-00:36	4 days 21.0	hours
					IU_ANTO_LHZ_00/LISS IU_ANTO_BHZ_00/LISS	3.25	3 24.773	274-17:32 2	96-11:45 96-11:51	9:46 hours	
					/pf/orbmag GT LBTB BHZ 00/SEED	0.10			96-13:11 96-13:40	8:26 hours 7:57 hours	
					CU_GRGR_BHZ_00/SEED IU TROA LHZ 00/LISS	26.9	8 14.169	274-17:32 2	96-16:55	4:43 hours 4:25 hours	
					IU_TRQA_BHZ_00/LISS	45.41	0 24.385	274-17:32 2	96-17:17	4:20 hours	
					II_TLY_LHE_00/GENC II_TLY_BHE_00/GENC	3.41 68.63			96-18:24 96-18:30	3:13 hours 3:08 hours	
					II_KURK_LHZ_00/GENC II KURK BHZ 00/GENC	3.92 78.41	4 1.475		96-20:23 96-20:29	1:14 hours 1:08 hours	
					IC_BJT_LHZ_00/LISS	4.5	7 2.452	274-17:01 2	96-21:01	36:16 minut	es
<- Page updat	ted 09:38:13 PM	1 22 October 2	2012 UTC (refres		IC_HIA_LHZ_00/LISS IC_ENH_LHZ_00/LISS	4.5	1 2.439	274-17:00 2	96-21:01 96-21:01	36:13 minut 36:03 minut	es
					IC_MDJ_LHZ_00/LISS IC_QIZ_LHZ_00/LISS	4.5			96-21:02 96-21:03	35:47 minut 34:41 minut	
					IC_LSA_LHZ_00/LISS	4.3	5 2.339	274-17:00 2	96-21:04	33:17 minut 29:11 minut	•=
					IC_HIA_BHZ_00/LISS IC_LSA_BHZ_00/LISS	52.00	1 27.925	274-17:04 2	96-21:08	29:07 minut	63
					IC_ENH_BHE_00/LISS IC MDJ BHE 00/LISS	49.95			96-21:08 96-21:08	29:03 minut 29:01 minut	
					IC_BJT_BHZ_00/LISS IC_OIZ_BHZ_00/LISS	45.71	5 24.592	274-17:04 2	96-21:09		es
					IU_BBSR_LHZ_00/LISS	1.31	7 0.707	274-17:29 2	96-21:13	24:04 minut	es
					IU_SLBS_LHZ_00/LISS	4.75	4 2.553	274-10:10 2	96-21:23	14:46 minut 12:51 minut	



### rtwebserver connection logging: who is connecting

	00		rtwebtrack peers					
<u>F</u> il-	e <u>E</u> dit <u>V</u> iew <u>O</u> ptions	<u>G</u> raphics			<u>H</u> elp			
ok	Х				←   →			
0	peer	peername	time	nregs	Iddate			
	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			
7	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			
15	M				<)			
Dismiss								



### rtwebserver connection logging: what are they asking for

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



# Peregrine: What's New

- Heavily improved image-serving architecture
- Robustness fixes
- Smoother auto-updates of images
- Rtcache enhancements
  - Autoharvest mode
  - Interaction support
  - Xvfb restarting
  - Enhanced image harvest
- Basic Interaction



# Peregrine: What's coming

- RTM remote control
- Further work on interaction
- Log-file monitoring
- Authentication and Password protection
- Enhanced Mapping



### Thank You

 For Purchase Information on Peregrine, contact Ogie Kuraica at Kinemetrics, Inc.
 – ogie@kmi.com



### 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



# 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

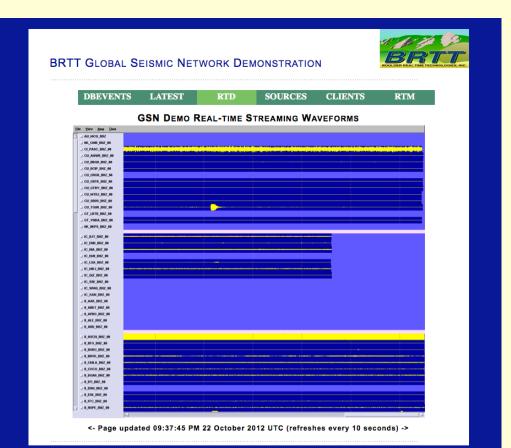


### Summary --

- 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: What's the difference?

- No ImageMagick! (whew)
- No Installation sysadmin of open-source code
- No Configuration sysadmin of 3<sup>rd</sup> 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 rtexec system
- Parameter-file configured
- Python modules included to provide capabilities



### rtwebserver

- Self-contained web-server
   % rtwebserver -v -P 8000
- Runs under rtexec
- 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.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
                        rpy:webitems/sources.rpy
      sources
      clients
                        rpy:webitems/clients.rpy
      dynamic &Arr{
                        rtcache:ximage
        ximage
      }
      images &Arr{
        brtt logo.gif
                        file:webitems/images/brtt logo.gif
                        file:webitems/images/dots.gif
        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"><img id="logo" src="/images/brtt logo.gif"/></span>
               BRTT Global Seismic Network Demonstration
               </div>
               <img class="dots" alt="dots" src="/images/dots.gif"/>
       }
   }
}
```



### rtwebserver.pf

```
site &Arr{
 stylesheet &Literal{
        html, body {
          background: #0c2093 ;
          margin: Opx ;
          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



### Peregrine Future

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

