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# Extending Systems Management Using Red Hat Network Satellite API

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# Audience

- Technical Rating: 3.5/5
- Scripting/programming experience recommended
- Hands-on demonstration
- System administrators, Implementors, Architects

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# Agenda

- RHN Satellite Overview
- API Overview
- API Documentation and Examples
- Executing Examples
- Beyond the Basics
- Integration with Other Software
- Common Pitfalls
- Troubleshooting

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# RHN Satellite

- Systems Management
- Package updates/installation/removal
- Provisioning (Including Virtual Guests)
- Configuration Management
- Monitoring
- Remote Command Execution



# API Overview

- Remote administration and reporting
- Simple XMLRPC interface
- Anything in UI can be done through the API (mostly)
- Namespaces divide functionality: 'system', 'channel' ...
- XMLRPC client support in most languages
  - Built-in (Python)
  - External libraries (Perl)
  - Java, Ruby, PHP, etc.



# API Overview (Cont.)

- XMLRPC uses simple data types and structures
- string, int, boolean, double, date, binary data (base64)
- Array: list of items
- Struct: key value pairs (hash, map, dict)
- Types and structures usually represented in native language data types
  - Some exceptions (more on that later)



# Documentation

- Available via html and pdf at:
  - <http://redhat.com/docs>
    - Select “Red Hat Network Satellite” and Go
    - Select “API Overview”
- Also installed on Satellite Server
  - Direct link: [http://SATELLITE\\_FQDN/rpc/api](http://SATELLITE_FQDN/rpc/api)
  - Or log into Satellite Server
    - Select “Help”
    - Select “API”





# Examples - Perl

```
use Frontier::Client;

my $client = \
    new Frontier::Client(url=>"http://satellite.example.com/rpc/api");
my $auth = $client->call('auth.login', 'user', 'password');
my $systems = $client->call('system.listUserSystems', $auth);
foreach my $system (@$systems) {
    print $system->{'name'}."\n";
}
```



# Examples - Python

```
from xmlrpclib import Server  
client = Server('http://satellite.example.com/rpc/api')  
auth = client.auth.login('user', 'password')  
systems = client.system.listUserSystems(auth)  
for system in systems:  
    print system['name']
```

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# Examples - Java

```
import java.util.List;
import java.util.Map;
import java.util.ArrayList;
import redstone.xmlrpc.XmlRpcClient;

public class Test {
public static void main( String[] cmdargs ) throws Exception {

    XmlRpcClient client = new XmlRpcClient( "http://satellite.example.com/rpc/api", false );
    List args = new ArrayList();
    args.add("user");
    args.add("password");

    String auth = (String) client.invoke("auth.login", args);
    args.clear();
    args.add(auth);
    List<Map> systems = (List<Map>) client.invoke("system.listUserSystems", args);

    for (Map server : systems) {
        System.out.println(server.get("name"));
    }
}
```

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# Executing the Examples

- Live Demonstration
- A video recording will be posted here:
  - <http://people.redhat.com/vvaldez/videos/>

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# Beyond the Examples

- Choose a different methods and/or namespaces
- Combine several methods for more robust functionality
  - `org.listSoftwareEntitlements`
  - `org.listUsers`
  - `channel.listAllChannels`
  - `channel.software.listAllPackages`
- Use data structures from one output to iterate through



# Integration with Other Software

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# What You Can Do

- Build complex interactions with other APIs
- Combine several different vendor APIs to script complex tasks
- Use workflow managers to further integrate
- Generate custom reports



# Integration with Other Software

- HP Operations Orchestration
- dell-satellite-sync
- create-channel-update
- Spacecmd
- Grid on a Cloud (GOAC)





# RHN Satellite and HP Operations Orchestration

- Leverage automation system of HP OO
- Execute any API call through Perl or Java
- Combine with HP Server Automation for full systems management coverage

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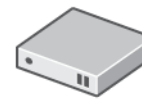
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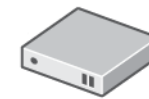


# RHN Satellite and HP Operations Orchestration

- Need to manage heterogeneous systems
- Can use disparate management systems



Windows



Solaris



Red Hat  
Enterprise Linux

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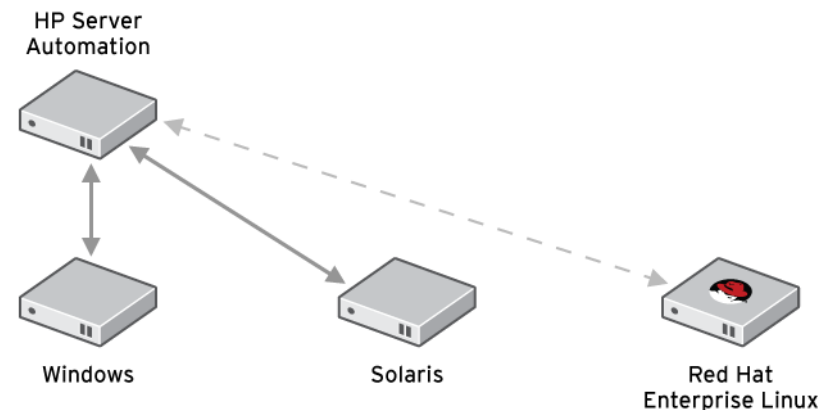
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# RHN Satellite and HP Operations Orchestration

- HP Server Automation can manage lifecycle of cross-platform systems
- Cannot manage all aspects of RHEL



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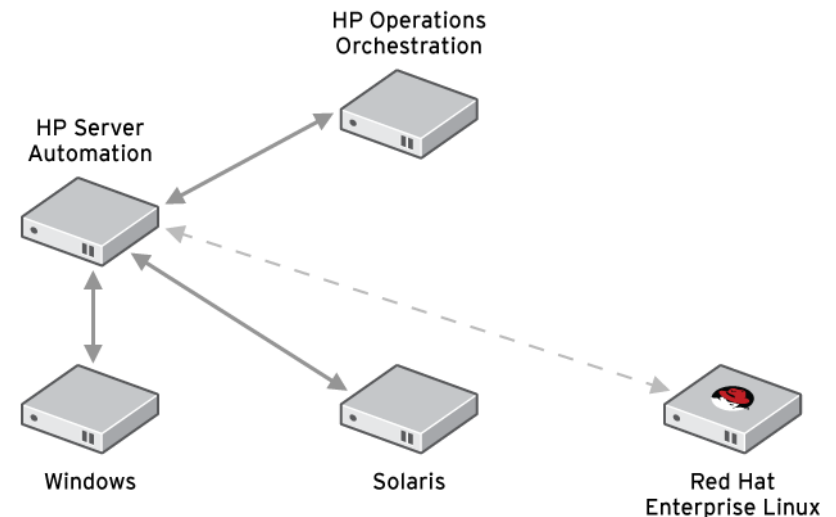
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# RHN Satellite and HP Operations Orchestration

- HP SA can be automated further with HP OO
- HP OO is a workflow manager containing a pre-populated library



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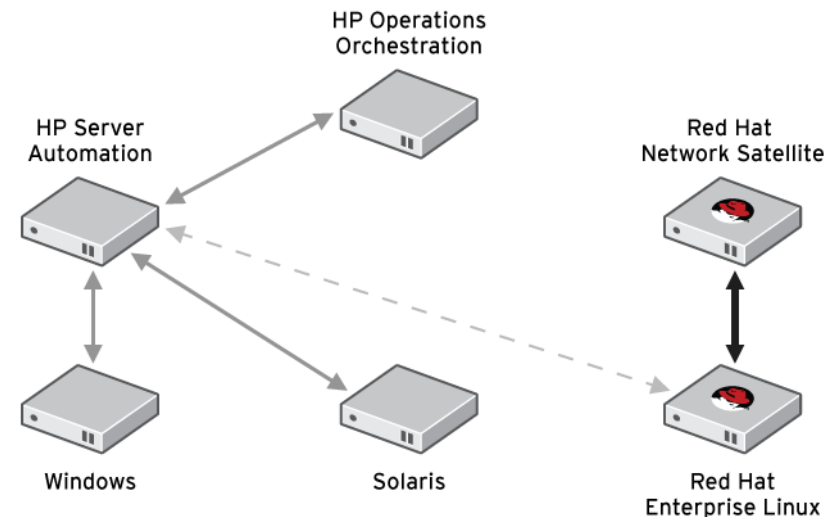
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# RHN Satellite and HP Operations Orchestration

- RHN Satellite can complement HP SA
- Only RHN Satellite can manage subscription compliance
- Only RHN Satellite can provision KVM or RHEV virtual machines



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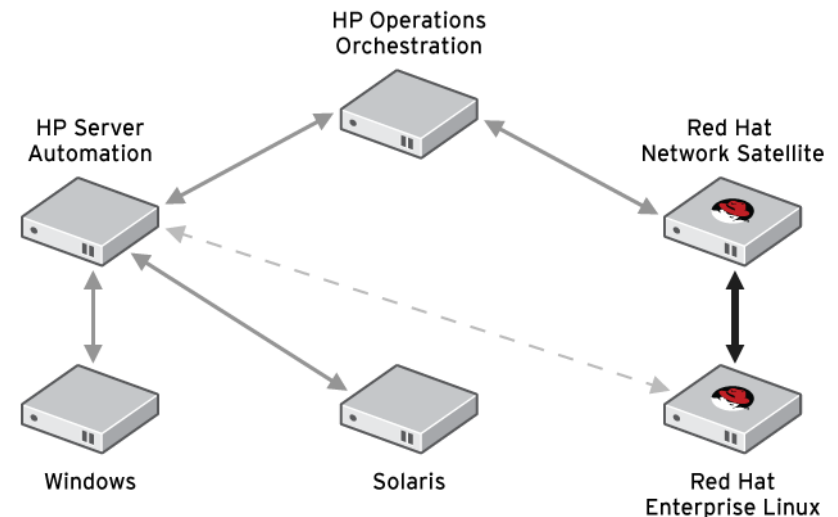
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# RHN Satellite and HP Operations Orchestration

- With integration scripts, HP OO can control both HP SA and RHN Satellite
- Manage everything from a single portal
- Leverage existing investment



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# Dell Satellite Sync

- Dell repositories contain specific drivers/firmware
- Run bash script to register with repositories
- Some customers create local repo mirror
- Very manual process



# Dell Satellite Sync

- Wrote integration script “dell-satellite-sync”
- Automates the following:
  - rsync Dell's repos locally
  - Create channels on RHN Satellite for each Dell system
  - Subscribe any Dell systems to relevant channels
- RHN Satellite 5.4 will ship with repo-sync in UI





# Dell Satellite Sync

```
[vinny@vvaldez ~]$ dell-satellite-sync --server satserver.example.com --user satadmin \  
--localdir /home/vinny/dell-repo/ --repo http://linux.dell.com/repo/hardware/latest_quarterly/ \  
--rhel5-only --force --only-systems per900,per805  
Password:  
06.11.2009 16:01:15: Using GPG keys from: 'http://linux.dell.com/repo/hardware/latest_quarterly/'  
06.11.2009 16:01:15: Starting rsync process using repository: 'linux.dell.com/repo/hardware/latest_quarterly/'  
06.11.2009 16:01:16: Waiting for rsync: pid: 3251 size: 328M /  
  
06.11.2009 16:01:17: Using local directory: /home/vinny/dell-repo/  
06.11.2009 16:01:17: Checking base channels on Satellite server  
06.11.2009 16:01:17:   Checking child channels for rhel-x86_64-server-5  
06.11.2009 16:01:17:   Checking child channels for rhel-i386-server-5  
06.11.2009 16:01:17: Pushing rpms into Satellite as needed  
06.11.2009 16:01:17:   Syncing rpms for child channels in rhel-i386-server-5  
06.11.2009 16:01:29:   Syncing rpms for child channels in rhel-x86_64-server-5  
06.11.2009 16:02:17: Completed uploading rpms.  
  
06.11.2009 16:02:17: Subscribing registered systems to the platform_independent channel.  
06.11.2009 16:02:17: Warning: whitebox.example.com vendor is 'unknown', skipping. Force with --all if desired.  
06.11.2009 16:02:19: Scheduling software installation and actions on clients.  
06.11.2009 16:02:19: Waiting for client actions to complete.  
06.11.2009 16:19:15: . . . . . waiting for results . . . . .  
06.11.2009 16:19:16: All actions completed.  
  
Completed: ['per805.example.com', 'per900.example.com']  
Skipped: ['whitebox.example.com']
```

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# Create Channel Update

- Common customer feature
- Create a channel to a specific update level (i.e. RHEL4u3)
- Upgrade an existing channel to a higher update level on an RHN Satellite or Spacewalk server.
- Data was hard, creation was easy
- <https://fedorahosted.org/spacewalk/wiki/channel-to-update>
- Justin Sherrill <jsherrill@redhat.com>



# Spacecmd

- Access Satellite from CLI without writing API scripts
  - Interactive shell with tab completion
  - Scriptable, accepts single commands
  - Advanced searching
- Project Details
  - Aron Parsons <aron@redhat.com>
  - <http://people.redhat.com/aparsons/>
  - <http://github.com/aparsons/spacecmd>



# Spacecmd

- System Details

```
spacecmd> system_details www01.example.com
Name:          www01.example.com
System ID:     1000010001
Locked:        False
Registered:    20100311 19:31:36
Last Checkin: 20100621 18:31:53
OSA Status:    online

Hostname:      www01.example.com
IP Address:    192.168.1.80
Kernel:       2.6.18-164.el5
```

- Build custom commands

```
[root@sat]# spacecmd get_entitlements | grep -e monitoring -e provisioning
monitoring_entitled: 314/397
provisioning_entitled: 322/397
```

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# Spacecmd

- Scriptable single actions

```
[user@sat]$ spacecmd -y system_installpackage www* mod_python  
Scheduled 6 system(s)
```

```
[user@sat]$ spacecmd -y system_removepackage wiki02 mod_perl  
Scheduled 1 system(s)
```

```
[user@sat]$ spacecmd -y errata_apply RHSA-2010:0423  
Scheduled 42 system(s)
```

- Tab completion

```
spacecmd> system_installpackage ssm vmware-tools [tab]  
vmware-tools          vmware-tools-kmod  
vmware-tools-common  vmware-tools-nox
```

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# Spacecmd

- System set manager

```
spacecmd> ssm_add *  
Systems Selected: 380
```

```
spacecmd> system_listerrata ssm  
System: ldap03
```

```
Security Errata:
```

```
RHSA-2010:0458 Moderate: perl security update 6/7/10  
RHSA-2010:0449 Moderate: rhn-client-tools security update 6/1/10  
RHSA-2010:0423 Important: krb5 security update 5/18/10
```

```
-----  
System: www01
```

```
Security Errata:
```

```
RHSA-2010:0458 Moderate: perl security update 6/7/10
```

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# Grid on a Cloud

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# Common Pitfalls

- Escape arrays (Perl)
  - <https://fedorahosted.org/spacewalk/wiki/SpacewalkApiPerlGuide>
  - `$client->call('activationkey.addChildChannels', $session, $key, \@channels);`
- Understanding expected and return data
- Frontier client rpms
  - Available in EPEL
  - Install from CPAN





# Troubleshooting

- Verbose mode:
  - `client = Server('http://satellite.example.com', verbose=1)`
- Logs
  - `/var/log/tomcat5/catalina.out`
  - `/var/log/httpd/access_log`
  - `/var/log/httpd/ssl_access_log`
  - `/var/log/rhn/rhn_web_api.log` (5.3 or newer)



# Troubleshooting

- Errors:
  - “The specified handler could not be found” - verify handler spelling
  - “Can not find method XYZ in class ...” - possible reasons:
    - Misspelling method name
    - Providing the wrong number or type of argument
  - 502 Proxy error:
    - Timeout – divide up work into multiple XMLRPC calls



# Related Red Hat Summit Sessions

- Managing Business Critical Applications with Red Hat Network Satellite
  - Wednesday, June 23 10:20 am - 11:20 am
- Case Study: Deploying Data Centers with Puppet (with satellite)
  - Wednesday, June 23 4:20 pm - 5:20 pm
- Utilizing Red Hat Management Solutions to Enable PCI Compliance: A Customer Perspective
  - Thursday, June 24 2:00 pm - 3:00 pm
- Red Hat Network Satellite Power User Tips & Tricks
  - Thursday, June 24 4:20 pm - 5:20 pm
- Begin Programming Your Red Hat Network Satellite Server
  - Thursday, June 24 4:20 pm - 5:20 pm

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# References

- [redhat.com/docs](http://redhat.com/docs)
  - Red Hat Network Satellite
    - API Guide, Sample Scripts
- Create-channel-update
  - <https://fedorahosted.org/spacewalk/browser/scripts/channel-to-update-level>
- dell-satellite-sync
  - <https://fedorahosted.org/dell-satellite-sync/>
- Grid on a Cloud
  - <http://people.redhat.com/jlabocki/summit/2010/>

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