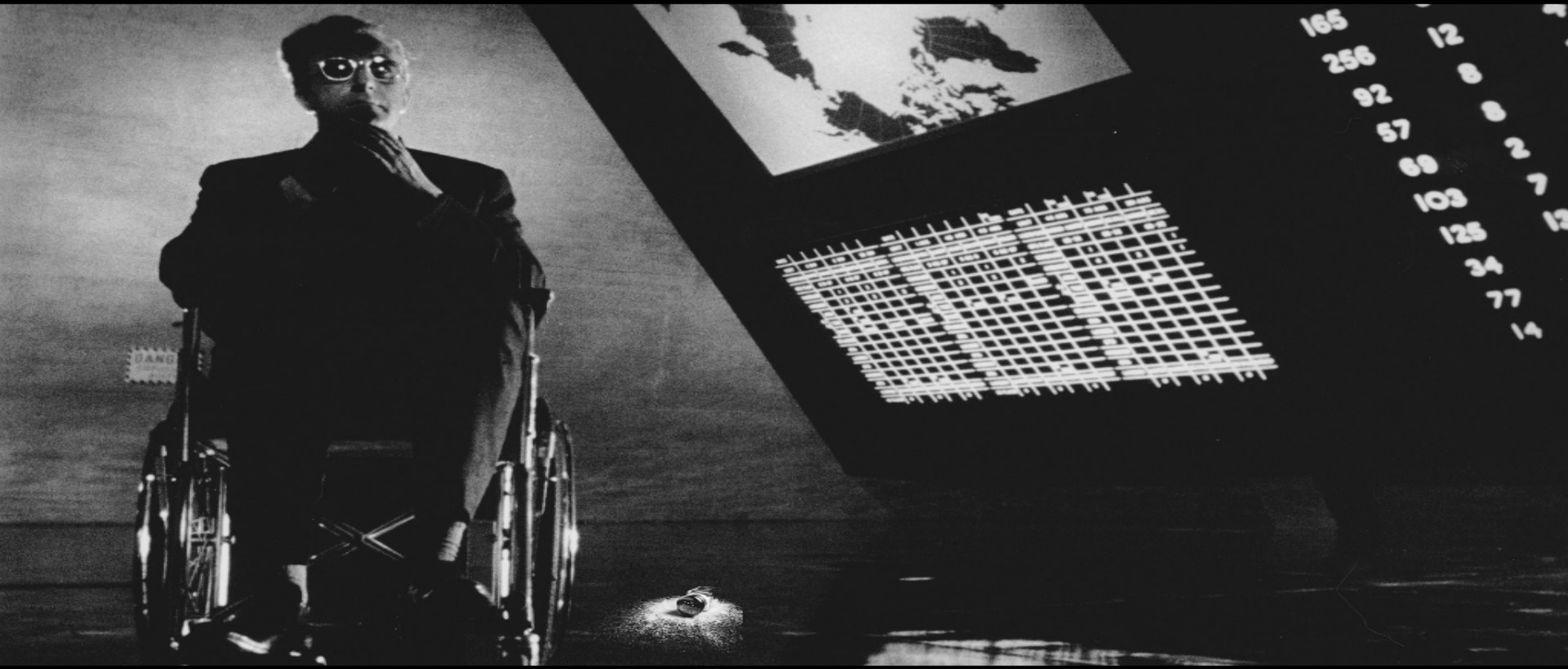
Dr. SaltStack



or: How I Learned to Stop Worrying and Replace the Cron

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Scheduling Jobs

*under Un*x like operating systems.

What we want

What We Want

1. Easily schedule a job.
2. Easy notification of job completion.
3. Different notification depending on job.
4. Schedule remotely across many nodes.
5. Enable, Disable, and Move Jobs.

A few different options

at

```
echo "cc -o foo foo.c" | at 11:45 jan 31
```

Pros

- Available on most Linux & *BSD systems, even Windows and OS X.
- Simple syntax to schedule jobs
- Management tools: at,atq, and atrm
- Notifications via email

Cons

- One time run.
- Node specific management.

What We Want

1. Easily schedule a job. ✱
2. Notification of job completion. ✱
3. Different notification depending on job. ✖
4. Remotely across many nodes. ✖
5. Enable, Disable, and Move Jobs. ✖

cron

MAILTO: user@example.com

00 20 * * * /home/user/command.sh

MAILTO: user@example.com
00 20 * * * /home/user/command.sh
MAILTO: admin@example.com
59 23 * * * /usr/sbin/service apache restart

Pros

- Also available on most Linux & *BSD systems, and Windows and OS X.
- Relatively simple syntax to schedule jobs
- Management tools: crontab
- Notifications

Cons

- Still node specific management.
- Having to check the man page for which column is which

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Alternatives

Manage ‘at’ jobs with Salt

Execution Module

‘at’

Schedule ‘at’ job

salt '*' at.at <timespec> <cmd> [tag=<tag>] [runas=<user>]

Example:

salt 'node1' at.at 12:05am '/sbin/reboot' tag=reboot

State Execution Module

‘at’

Schedule ‘at’ job.

```
rose:
  at.present:
    - job: 'echo "I love saltstack" > love'
    - timespec: '9:09 11/09/13'
    - tag: love
    - user: jam
```

Manage ‘cron’ with Salt

Similar execution and state modules for cron

```
salt 'node1' cron.set_job root '*' '*' '*' '*' 1
/usr/local/weekly
```

```
date > /tmp/crontest:
  cron.present:
    - user: root
    - minute: 5
```

Still Limitations of both at and cron

Simply Use Salt

Disclaimer:

Some features presented currently available in the development branch but will be in future releases of Salt.

Powerful Scheduler

Schedule Configured on Minion

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
```

More precise by mimicking Cron.

```
schedule:
  job1:
    function: state.sls
    cron: '*/5 * * * *'
    args:
      - httpd
    kwargs:
      test: True
```

Available in 2014.7

And more clear.

```
schedule:
  job1:
    function: state.sls
    when: 'Monday 8:15pm'
    args:
      - httpd
    kwargs:
      test: True
```

Available in 2014.7

Multiple runs.

```
schedule:
 job1:
   function: state.sls
   when:
       - ‘Monday 8:15pm'
       - ‘Tuesday 3:00pm’
   args:
     - httpd
   kwargs:
     test: True
```

Available in 2014.7

Another example

```
schedule:
  job1:
    function: cmd.run
    when: 'Monday 8:15pm'
    args:
      - 'logger -t salt < /proc/loadavg'
    kwargs:
      stateful: False
      shell: \bin\sh
```

What We Want

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Notifications

Salt Returners

Examples of returners:

Syslog, MySQL, PostgreSQL, Redis

SMTP, XMPP, HipChat, Slack, Nagios

* 2014.7 release
* 2015.2 release
* Development branch

Scheduler + Returners

Notifications

```
schedule:
  job1:
    function: status.procs
    when: ‘8:15pm'
    returner: xmpp
```

Returner Configuration on Minion

XMPP Returner Configuration

xmpp.recipient: to-jid@gmail.com

xmpp.jid: from-jid@gmail.com/salt

xmpp.password: 12345

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Different Notifications

Alternative Returner Configuration

Available in 2015.2

XMPP Returner Configuration

alt.xmpp.recipient: different-jid@gmail.com

alt.xmpp.jid: from-jid@gmail.com/salt

alt.xmpp.password: 12345

Notifications

```
schedule:
  job1:
    function: status.procs
    when: '8:15pm'
    returner: xmpp
    return_config: alt
```

XMPP Returner Configuration

xmpp.jid: from-jid@gmail.com/salt

xmpp.password: 12345

john.xmpp.recipient: john@gmail.com

bob.xmpp.recipient: bob@gmail.com

dba.xmpp.recipient: dba@company.com

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Remotely Across Many Nodes

Remote Execution System

Schedule Execution Module (2014.7)

```
salt -G 'role:webserver' schedule.add apache_restart function='apache.signal' args=”restart” seconds=3600
```

```
salt 'cache*' schedule.add varnish_purge function=varnish.purge' when=”[’10:00am’,’10:00pm’]”
```

Configuration Management System

Schedule State Module (2014.7)

```
apache_restart:
  schedule.present:
    - function: apache.signal
    - args: restart
    - seconds: 3600
```

Schedule Jobs

```
job1:
  schedule.present:
    - function: state.sls
    - args:
      - httpd
    - kwargs:
      test: True
    - when:
        - Monday 5:00pm
        - Tuesday 3:00pm
        - Wednesday 5:00pm
```

What We Want

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5. Enable, Disable, and Move Jobs. ?

Disable, Enable and Move

Schedule Execution Module

schedule.disable_job

Available in 2014.7

salt -G ‘role:webserver’ schedule.disable_job apache_restart

schedule.enable_job

Available in 2014.7

salt -G ‘role:webserver’ schedule.enable_job apache_restart

schedule.move_job

Available in 2015.2

salt ‘webserver_new’ schedule.move_job apache_restart webserver_new

Other Available Functions

- schedule.copy
- schedule.delete
- schedule.disable
- schedule.enable
- schedule.list
- schedule.modify
- schedule.purge
- schedule.reload
- schedule.save
- schedule.run_job

2014.7

2015.2

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VIA 9GAG.COM

So what can we schedule?

Salt has almost 300* modules
and roughly
3000* module functions.

* not all modules and functions available on all systems.

Other Interesting Scheduler Features

Splay

Available in 2014.7

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    splay: 15
```

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    splay:
      start: 10
      end: 15
```

Range

Available in 2014.7

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    range:
        start: 8:00am
        end: 5:00pm
```

Inverted Range

Available in 2014.7

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    range:
        invert: True
        start: 8:00am
        end: 5:00pm
```

return_job

Available in 2015.2

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    return_job: True
```

metadata

Available in 2015.2

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    return_job: True
    metadata:
      foo: bar
```

until

Available in develop

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    until: '12/31/2015 11:59pm'
```

Other reasons to use Salt?

Typical crontab

```
# Job 1
00 20 * * * /home/user/command.sh
# Job 2
00 30 * * * /home/user/command2.sh
```

A better way

Combine the commands

```
# Job 1
00 20 * * * /home/user/command.sh &&
/home/user/command2.sh
```

Third Script, running both commands

```
# Job 1 & Job 2
00 20 * * * /home/user/command3.sh
```

Run commands from a Salt State

Dependencies and Requisites

require
watch
prereq
use
onchanges
onfail

require_in
watch_in
prereq_in
use_in
onchanges_in
onfail_in

schedule

```
schedule:
  run_jobs:
    function: state.sls
    when: ‘8:00 pm’
    args:
      - run_jobs.sls
```

state file

```
job1:
 cmd.run:
    -args: /home/user/command1.sh
job2:
 cmd.run:
    - args: /home/user/command2.sh
   - require:
     - cmd: job1
```

Scheduling Jobs with Salt Stack


Thank You!

Any questions?