.conf2014

YOUR DATA ADVENTURE

# In Depth with Deployment Server

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splunk>

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# What is Splunk Deployment Server?

splunk>

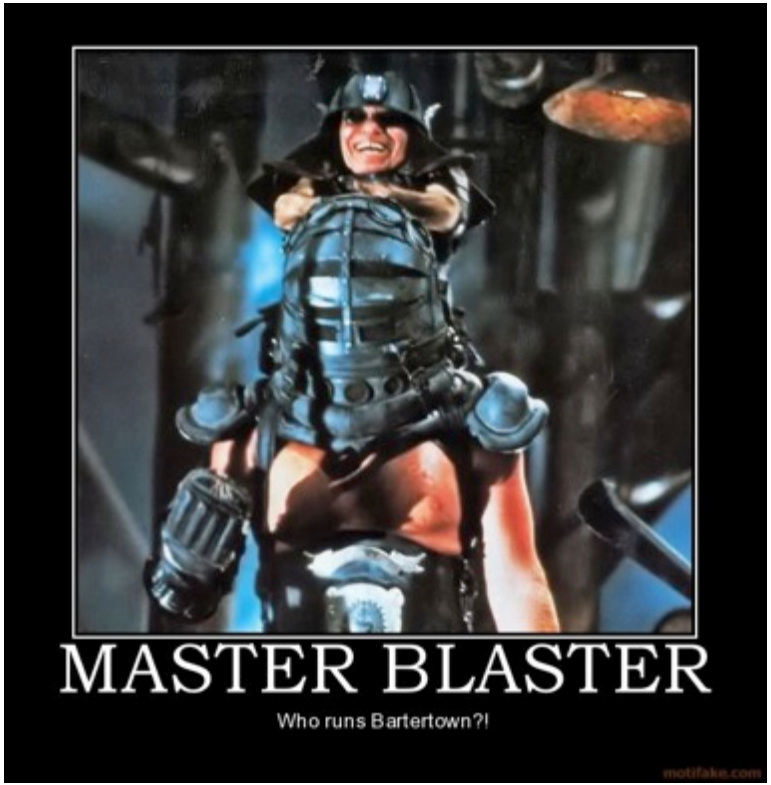
# What is Splunk Deployment Server?

- Doesn't actually deploy Splunk (common misperception)
- Acts as a configuration server
- Configurations are held in "apps" or "configuration bundles"
- Listens on the Splunk management port (8089 by default)
- Serves up lists of apps for clients to download and install
- The server configuration (serverclass.conf) describes what systems should download what apps

# Why use Deployment Server?

- No touching endpoints!
- Distribute add-ons to search heads to give users consistent field extractions
- Make sure you are getting a common set of inputs (satisfy auditors), that is, consistent configs
- Deployment server clients can be any part of Splunk infrastructure (search heads, indexers, forwarders of all types)

  (well, not clustered indexers)



# How can I select what systems are in what class?

- Serverclass.conf!
- Allows you to whitelist/blacklist/filter on different aspects of what is reported to the deployment derver
  - IP address
  - Host
  - ClientName (configured in deploymentclient.conf on the client)
  - machineTypesFilter (OS and architecture)

```
[serverClass:IntermediateHFs]
restartSplunkd = true
whitelist.0 = splk-heavyforwarder*
[serverClass:IntermediateHFs:app:DS-all_departments-IHF-base]
[serverClass:IntermediateHFs:app:DS-all_departments-Input-splunk_tcp_9997]
[serverClass:IntermediateHFs:app:DS-all_departments-Splunk-no_web]
```

# machineTypesFilter

- Acts as just what it says, filters systems based on OS and Arch
- Happens after the whitelist/blacklist
- This means that machineTypesFilter by itself won't match anything
- If you want all windows machines, you would need something like:

```
[serverClass:All-Windows]
restartSplunkd = true
whitelist.0 = *
machineTypesFilter = windows-intel,windows-x64
[serverClass:All-Windows:app:DS-all_departments-Input-windows_logs]
```

# How does this work?

- Serverclass.conf contains stanzas that define classes of systems (servers)
- Clients check in and subscribe to the classes they are included in
- Deployment server (DS) tarballs the deployment app, and hashes it
- The client keeps track of the hash of the app it has installed
- When it checks in, if the hash on the DS differs from what it has, the client downloads the new version
- After downloading, the client deletes the version it has and extracts the new version
- Restarting is optional (configured per serverclass)

# How does this work?

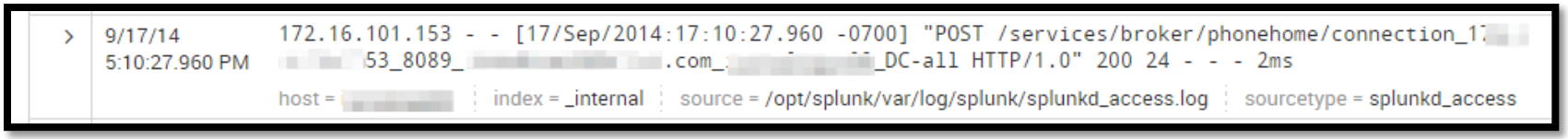
"Hmm, I haven't checked in in a while, better do that."

| | | |
|---|---|---|
| > | 9/9/14 10:05:31.104 AM | 09-09-2014 10:05:31.104 -0700 INFO DC:UpdateServerclassHandler - Changed state from=HandlingPhonehome to=Phonehome<br>host = [redacted] source = E:\Splunk\var\log\splunk\splunkd.log sourcetype = splunkd |
| > | 9/9/14 10:05:31.089 AM | 09-09-2014 10:05:31.089 -0700 INFO DC:UpdateServerclassHandler - Changed state from=Phonehome to=HandlingPhonehome<br>host = [redacted] source = E:\Splunk\var\log\splunk\splunkd.log sourcetype = splunkd |

# How does this work?

TCP 8089 (HTTPS)

“Hi, my name is forwarder1.
My IP is 192.168.1.2.
I have a ClientName of ForwarderSys.
I am running Windows on a 64-bit architecture.
I’m a Sagittarius (okay, not really).”



# How does this work?

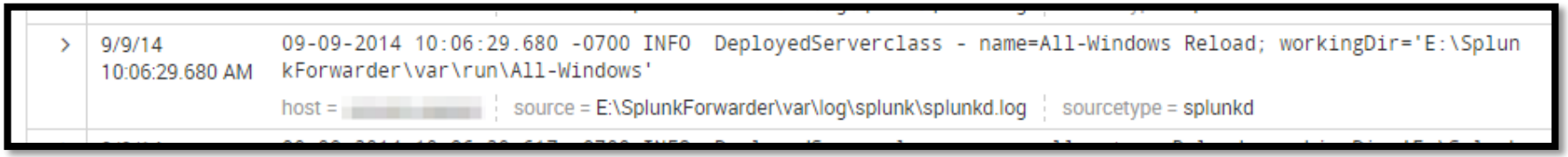
"Hmm. I haven't heard from this client since my last reload. I'll add it to the list of clients.

> 9/8/14 6:30:06.244 PM
> 09-08-2014 18:30:06.244 -0700 INFO ClientSessionsManager - Adding client: ip= uts=linux-x86_64 id=589025c9d87908d473e1b8af83bad99e name=DC-all
> host = source = /opt/splunk/var/log/splunk/splunkd.log sourcetype = splunkd

# How does this work?

Response (same TCP connection)

"Hi, forwarder1. You belong in these classes:
- WindowsForwarder
- LocalForwarder"



# How does this work?


"I need a list of the apps in these classes:

- WindowsForwarder
- LocalForwarder"

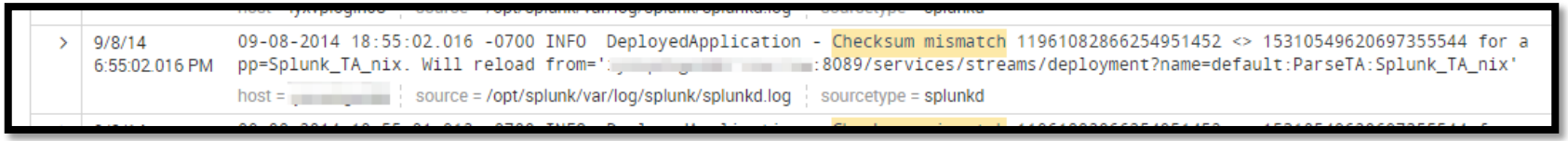
# How does this work?


"Sure, here are the apps and their hashes:

- Splunk_TA_windows  (hash: 9361937492720659309 8)
- Outputs_To_Indexers (hash: 11961082866254951452)"

# How does this work?

"Hmm, I have the right hash for Splunk_TA_windows, but for Outputs_To_Indexers I have a hash of 0. Better download it."



# How does this work?


"I need the latest version of Outputs_To_Indexers."

| | | |
|---|---|---|
| > | 9/9/14 10:06:29.680 AM | 09-09-2014 10:06:29.680 -0700 INFO DeployedServerclass - name=All-Windows Reload; workingDir='E:\SplunkForwarder\var\run\All-Windows' |
| | | host = [redacted] source = E:\SplunkForwarder\var\log\splunk\splunkd.log sourcetype = splunkd |

# How does this work?

Response (same TCP connection)

“Sure, here you go.”

| | | |
|---|---|---|
| > | 9/8/14 6:55:02.053 PM | 09-08-2014 18:55:02.053 -0700 INFO DeployedApplication - Downloaded url=[redacted]:8089/services/streams/deployment?name=default:ParseTA:Splunk_TA_nix to file='/opt/splunk/var/run/ParseTA/Splunk_TA_nix-1410218690.bundle' sizeKB=1120<br>host = [redacted] source = /opt/splunk/var/log/splunk/splunkd.log sourcetype = splunkd |

# How does this work?

"Okay, now that I have the new version, I'll delete the existing one, and replace it with the new and shiny version. After that, I'll restart the Splunk services, because I was told to. Then I'll tell the DS the good news."

| | | |
|---|---|---|
| > | 9/8/14 6:55:01.972 PM | 09-08-2014 18:55:01.972 -0700 INFO DeployedApplication - Installing app=Splunk_TA_nix to='/opt/splunk/etc/apps/Splunk_TA_nix'<br>host = [redacted] source = /opt/splunk/var/log/splunk/splunkd.log sourcetype = splunkd |

| | | |
|---|---|---|
| > | 9/10/14 12:13:38.805 PM | 09-10-2014 12:13:38.805 -0700 INFO ClientSessionsManager - ip=[redacted] name=DC-all Updating record for sc=SyslogFileInputs app=DS-all_departments-Input-syslog_files: action=Install result=Ok<br>action = Install eventtype = splunkd-log host = iyxvplogld01 index = _internal<br>source = /opt/splunk/var/log/splunk/splunkd.log sourcetype = splunkd splunk_server = i[redacted] |

# Things to remember

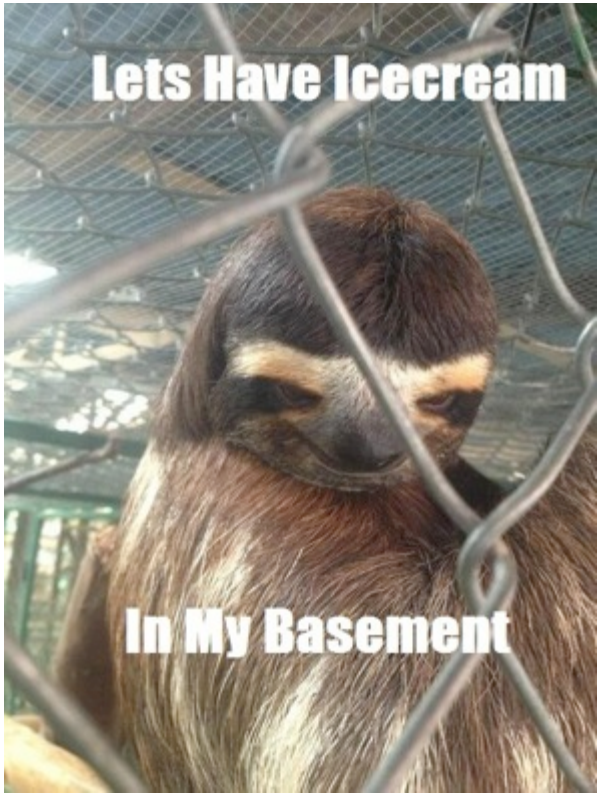
- Think of this as configuration enforcement (DS version wins!)
- Remember that delete portion. It will save you some headache.


Problems can happen…

splunk>

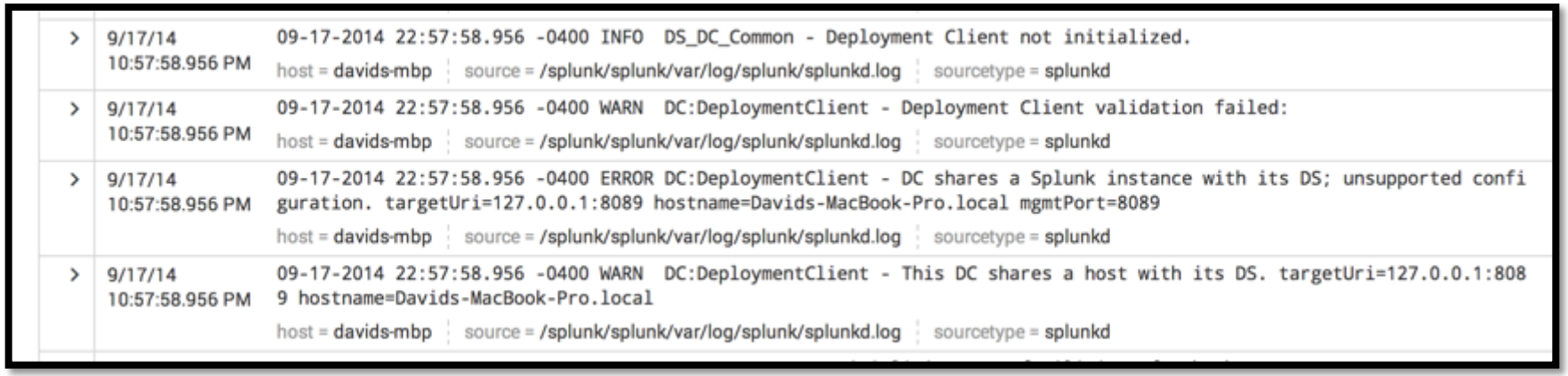
# Gotchas!

- Careful with lookups
- Splunk 6.2 resolves this problem, but older versions will overwrite the local lookup
- Careful with apps that have clickable content (setup GUIs, for example)
- General rule: Don't distribute apps with a UI where users can click to change configs
- Remember that delete thing? Yeah, the saved content would get nuked too
- Careful with what you restart
- Indexers and cluster masters can be touchy, restarting search heads means users may be unhappy



# Gotchas! (continued)

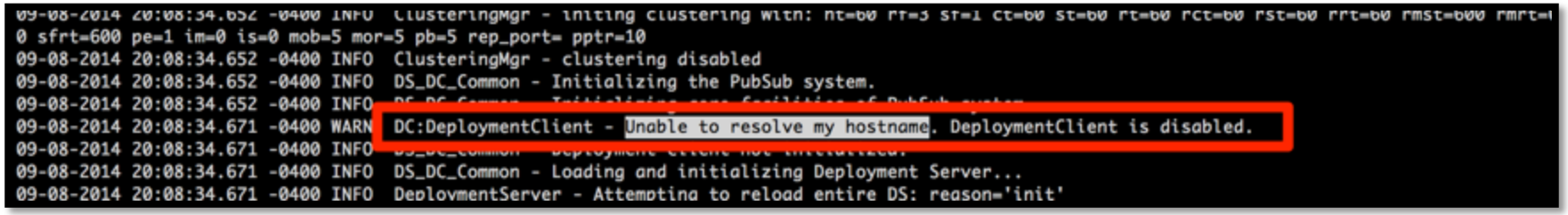
- A Deployment Server cannot deploy to itself
- 6.x will tell you about that, then may kill both.



| | | |
|---|---|---|
| > | 9/17/14 10:57:58.956 PM | 09-17-2014 22:57:58.956 -0400 INFO DS_DC_Common - Deployment Client not initialized.<br>host = davids-mbp source = /splunk/splunk/var/log/splunk/splunkd.log sourcetype = splunkd |
| > | 9/17/14 10:57:58.956 PM | 09-17-2014 22:57:58.956 -0400 WARN DC:DeploymentClient - Deployment Client validation failed:<br>host = davids-mbp source = /splunk/splunk/var/log/splunk/splunkd.log sourcetype = splunkd |
| > | 9/17/14 10:57:58.956 PM | 09-17-2014 22:57:58.956 -0400 ERROR DC:DeploymentClient - DC shares a Splunk instance with its DS; unsupported configuration. targetUri=127.0.0.1:8089 hostname=Davids-MacBook-Pro.local mgmtPort=8089<br>host = davids-mbp source = /splunk/splunk/var/log/splunk/splunkd.log sourcetype = splunkd |
| > | 9/17/14 10:57:58.956 PM | 09-17-2014 22:57:58.956 -0400 WARN DC:DeploymentClient - This DC shares a host with its DS. targetUri=127.0.0.1:8089 hostname=Davids-MacBook-Pro.local<br>host = davids-mbp source = /splunk/splunk/var/log/splunk/splunkd.log sourcetype = splunkd |

# Gotchas! (continued)

- The client hostname is important



# Gotchas! (continued)

- Careful with the numbering of your whitelists/blacklists in serverclass.conf

```
143 [serverClass:Level2Forwarders]
144 restartSplunkd = true
145 whitelist.1 = dns.company.com
146 whitelist.2 = loslobos.company.com
147 whitelist.3 = splunk.dept.*
148 whitelist.4 = 10.10.123.4
149 blacklist.0 = splunk01.dept.company.com
150 blacklist.1 = splunk02.dept.company.com
151 [serverClass:Level2Forwarders:app:DS-all_departments-Input-syslog_generic ]
152
```

# Gotchas! (continued)

- Splunk precedence still applies!
- $SPLUNK_HOME/etc/system/local/*.conf still wins
- The names of your apps still matter
- Splunk configuration layering is king!
- A fun Splunk tongue-twister:

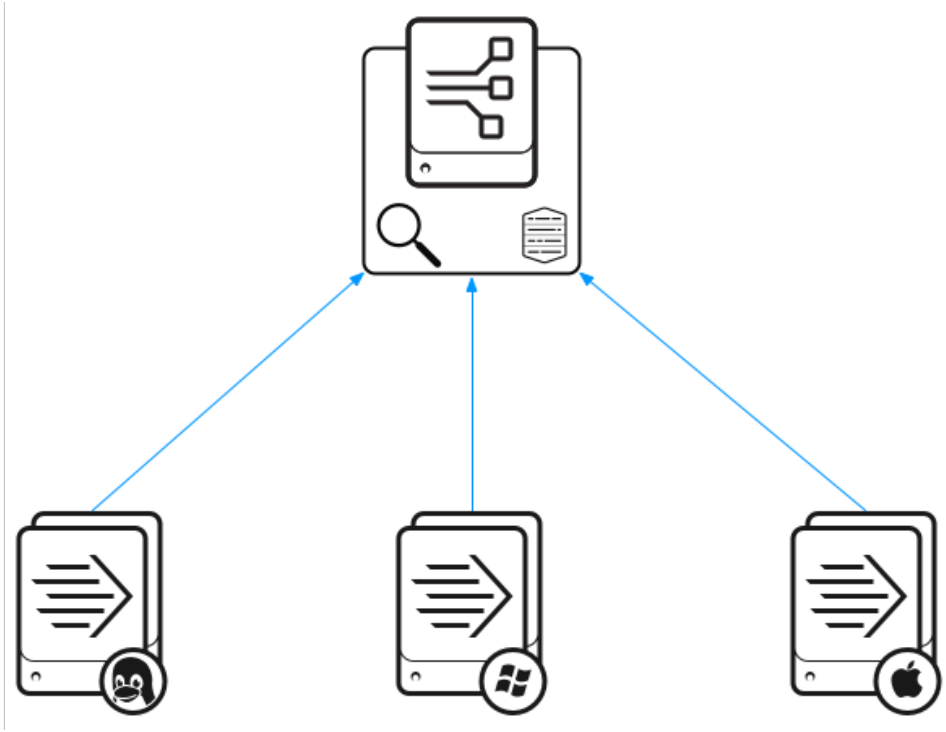
```
grep conf conf.conf | grep -v confdb
```

(run in $SPLUNK_HOME/etc/system/default)

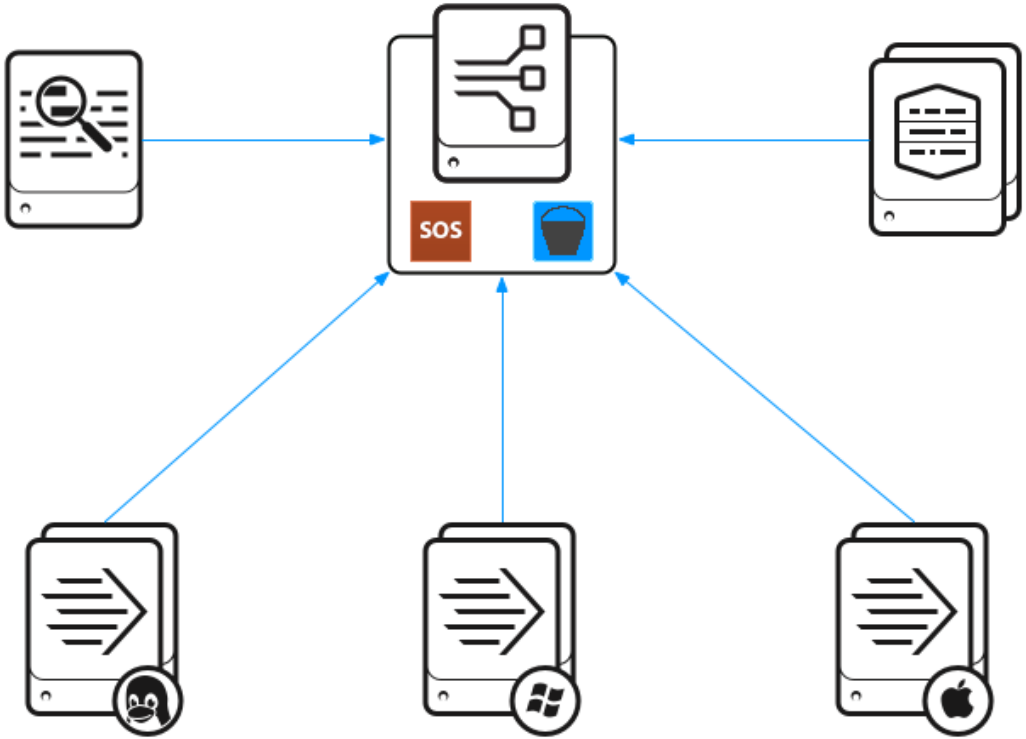

# Typical Deployment Patterns

splunk>

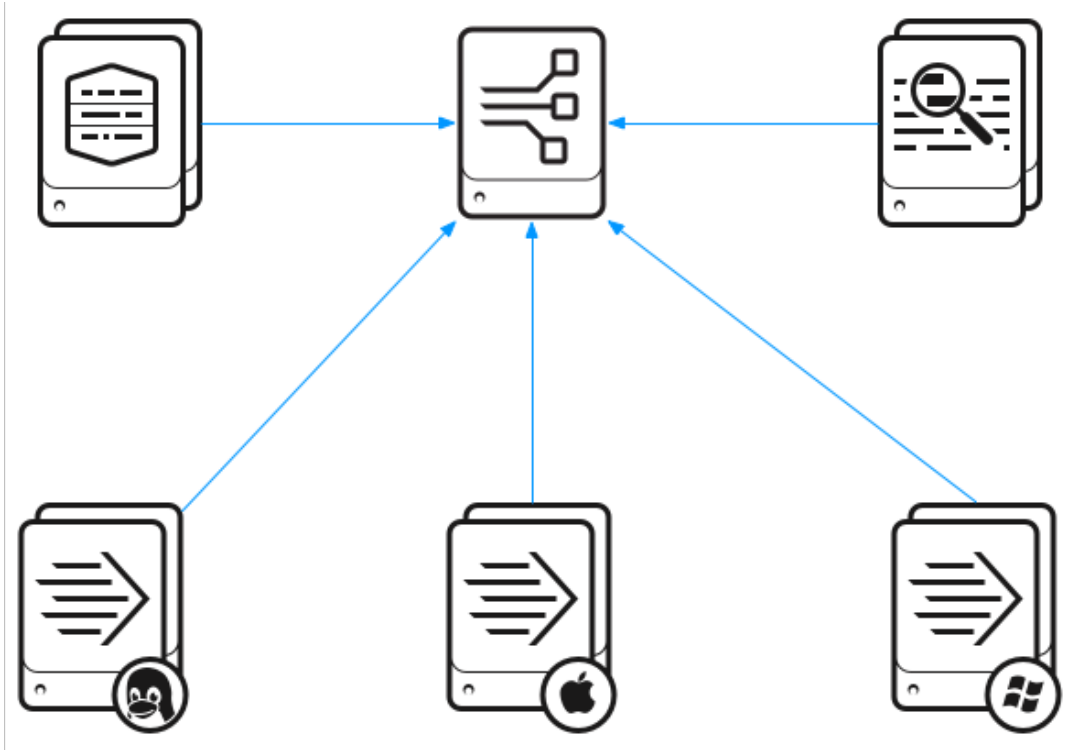
# The all-in-one



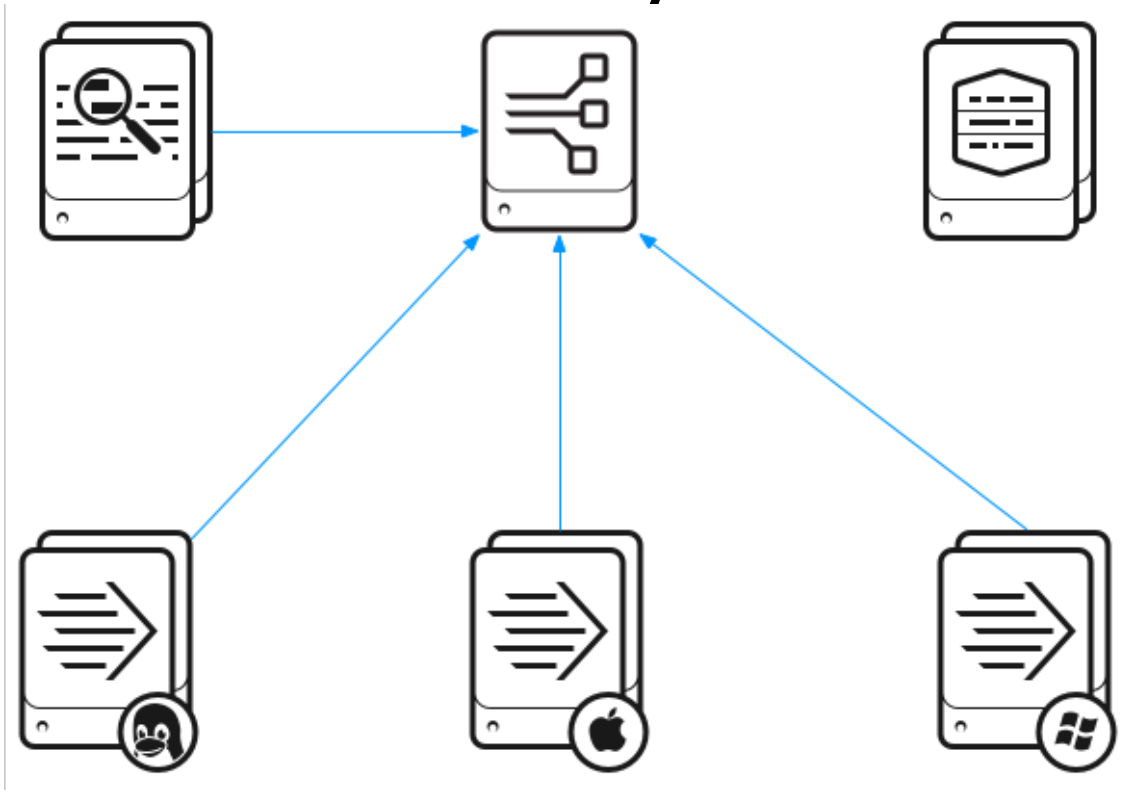
# The Admin Server



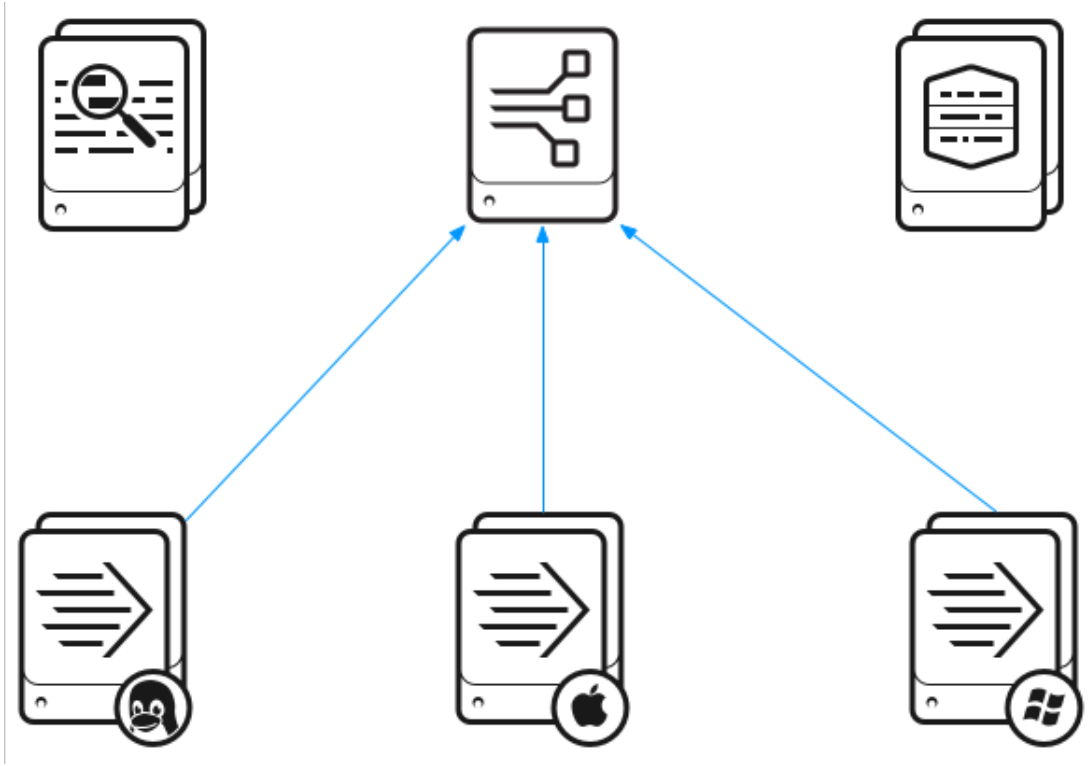
# Dedicated Deployment Server



# Don’t touch my indexers!



# Forwarders Only




# Advanced tips and tricks

splunk>

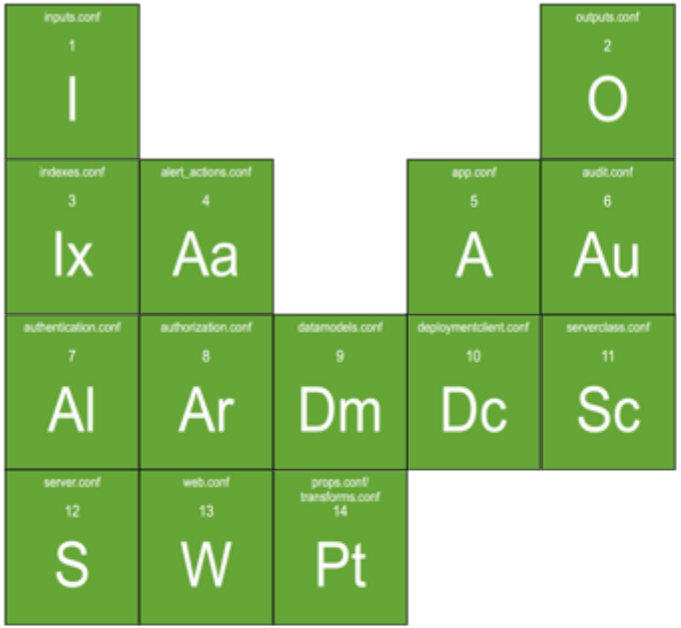
# Don’t chain yourself to a host/IP

- Hosts change (age out, break, need to be upgraded, it’s the circle of life)
- If you are using a host name or an IP in your deploymentclient.conf, and that IP or host name changes, that config file will need to be changed EVERYWHERE
- Instead, use a separate DNS record (A or CNAME) to enter into your client configs (“splunk-ds.mycompany.com”)

# Create smaller, more discrete apps

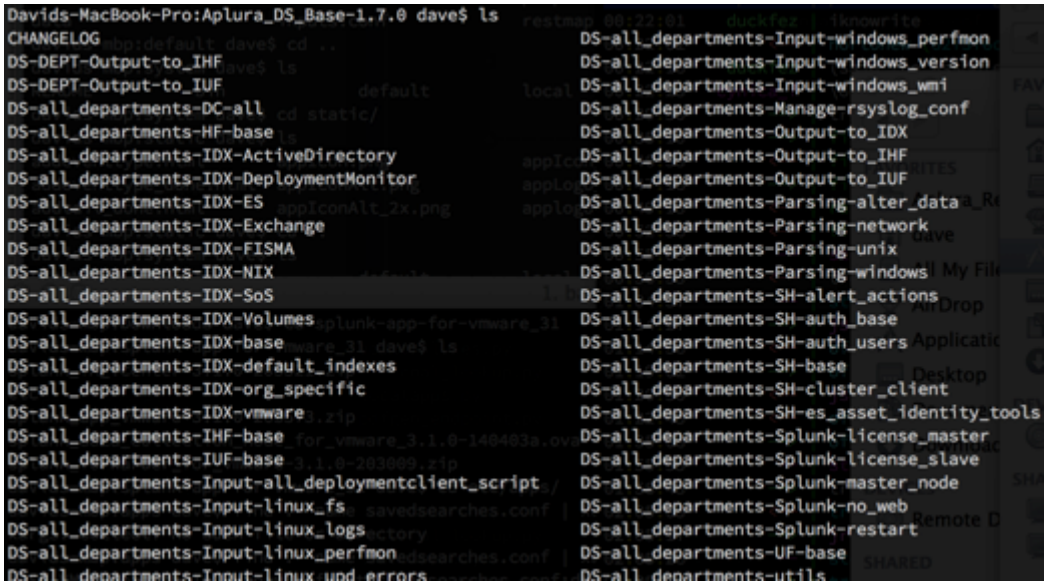
- Keep the number of config files per app low
- This creates smaller, reusable modules
- Lets you take advantage of Splunk's configuration layering
- Turns out, this is easier to debug
- Use a naming convention for the apps
- Example: DS-<org group>-<class>-<description>
  DS-dmz-Output-To_Forwarder
- Create classes of apps
- Input apps
- Index apps
- Web control apps (turn off Splunkweb)

# Atomic apps combine to make larger config molecules





# Yes, you may end up with a lot of apps…




- Naming convention + tab auto-completion FTW!
- On Linux? The “find” command is awesome!

```
# find /opt/splunk/etc/deployment-apps props.conf | xargs grep mysourcetype
```

# Why not larger apps?

- Very hard to reuse
- Configurations quickly become clumsy
- Makes debugging problems more difficult
- Not as flexible

# Remember that whole etc/system/local thing?

- Configuration layering always applies!
- Changing your deployment server? Migrating? Rename?
- $SPLUNK_HOME/etc/system/local/deploymentclient.conf WINS!
- Prepare to touch all your endpoints
- Puppet? Chef? SCOM? Pick your poison
- What about…

# Scripted inputs to the rescue

- Can run a script on a regular basis
- Can run on all of the deployment clients
- .sh, .bat
- Rename or remove the $SPLUNK_HOME/etc/system/local/deploymentclient.conf!
- The “splunk” user should already own the file
- Distribute the app to all systems, or create a server class that only applies to a section of clients

# Breaking up serverclass.conf…

- The configs can get long
- Serverclass.conf is like other Splunk config files, stanzas get added to each other

# … maybe not

- If you use the Forwarder Management GUI, it may fragment the configs in unexpected ways.
- May be the **one** file we actually only want in system/local

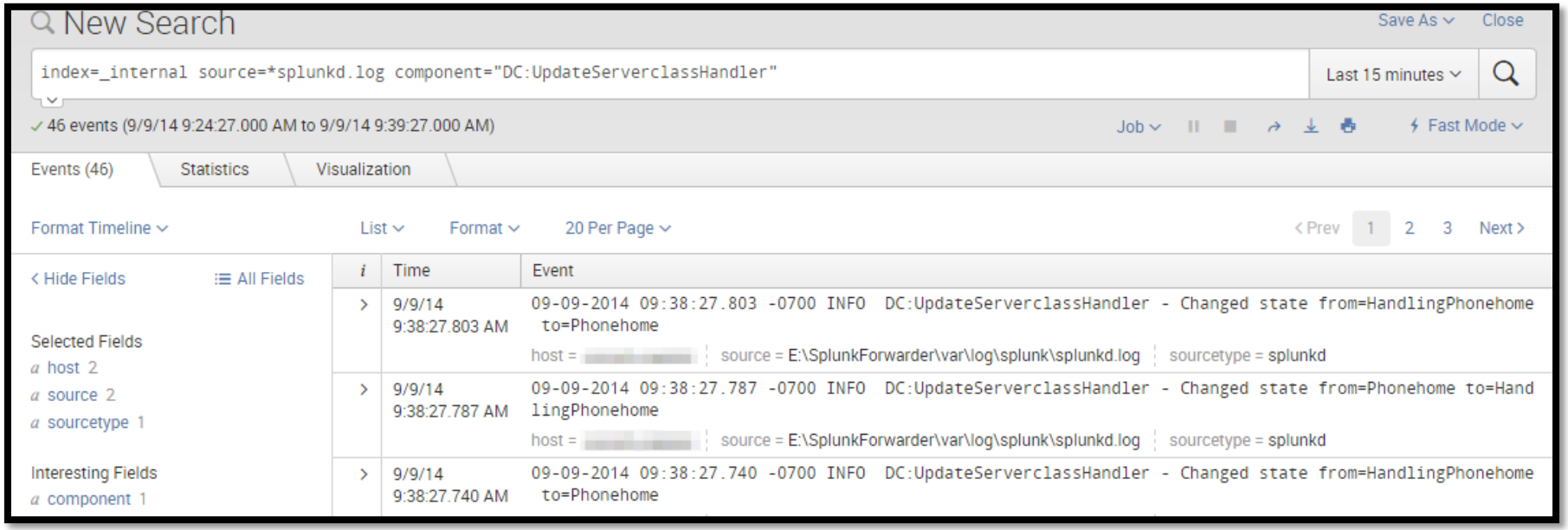

# Troubleshooting Splunk Deployment Server

splunk>

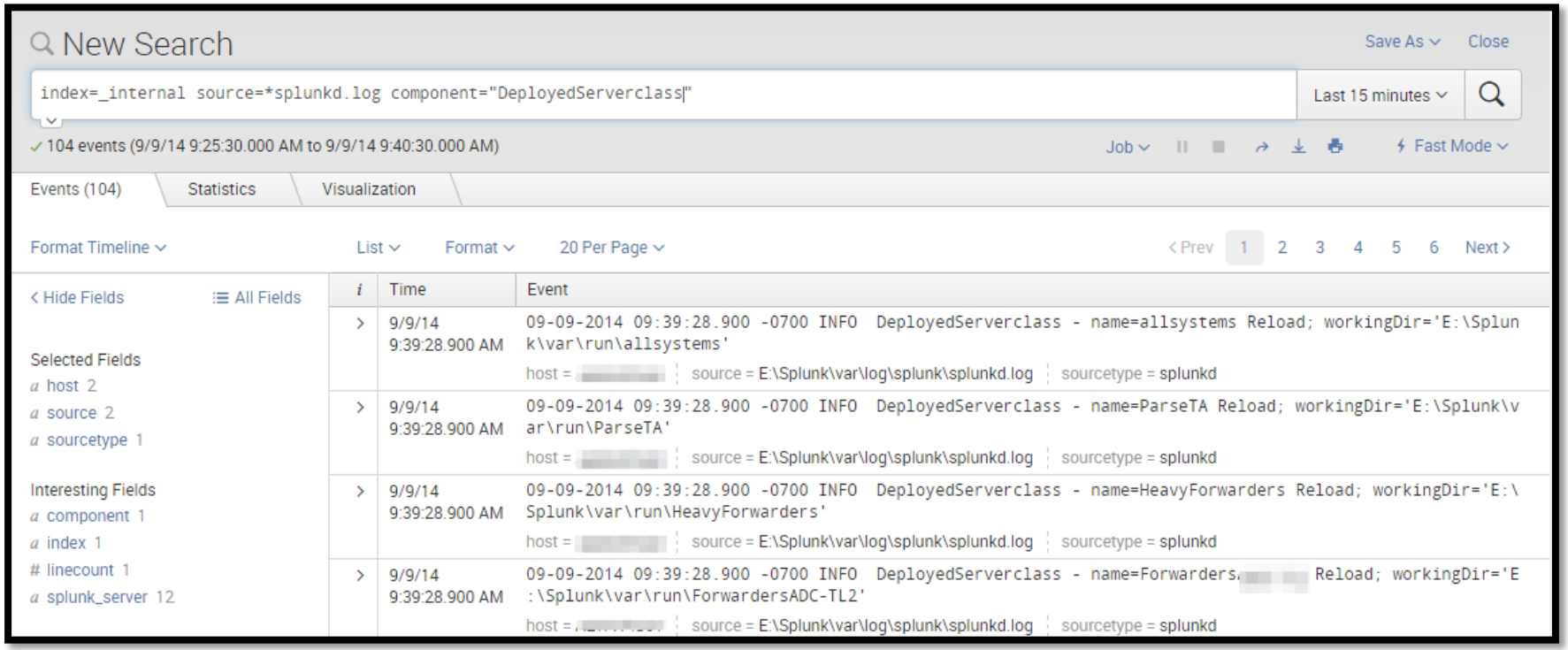
# Troubleshooting Deployment Server

- Host != FQDN
- Can the client resolve the name of the deployment server?
- Can the client communicate?
- Use the GUI to check for check-ins from the client
- Settings > Forwarder Management
- Search: index=_internal source=*splunkd.log ClientSessionManager
- Check that the correct apps are on the client
- Search from DS:
  index=_internal source=*splunkd.log ClientSessionsManager action=*

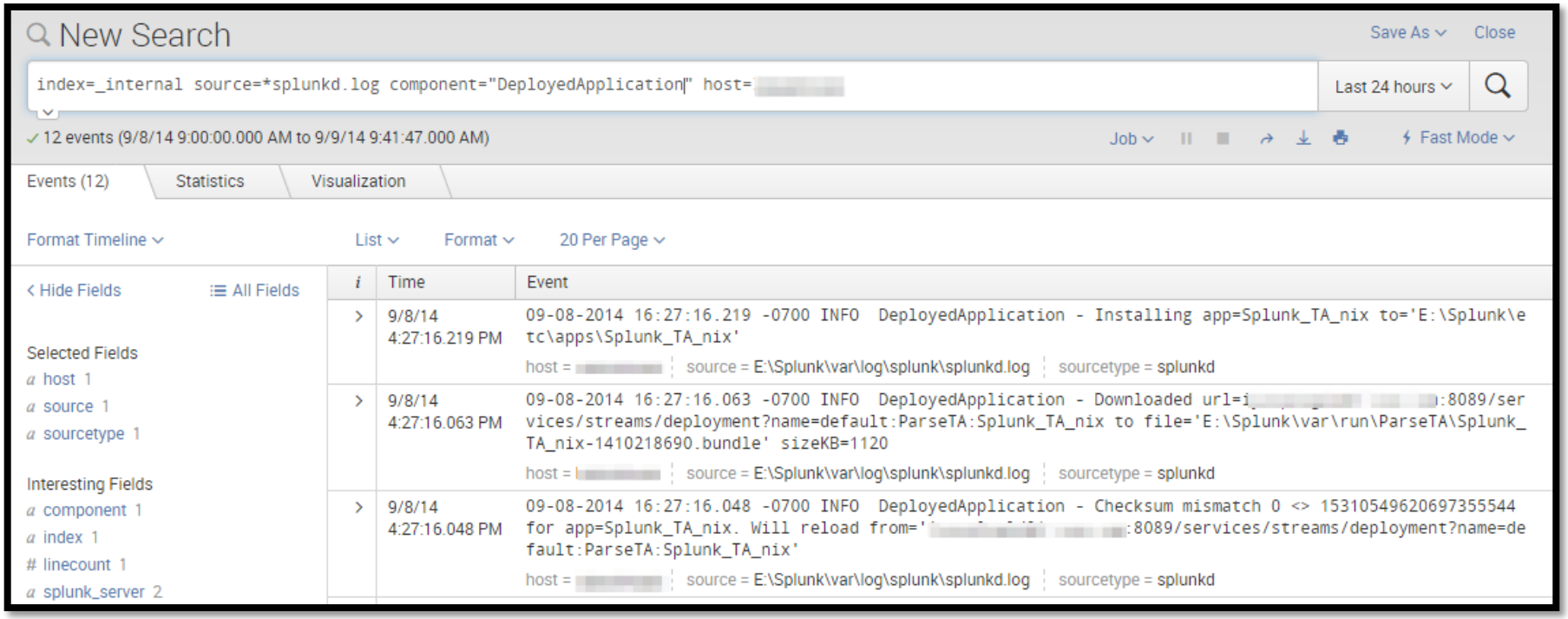
# Client: PhoneHome state



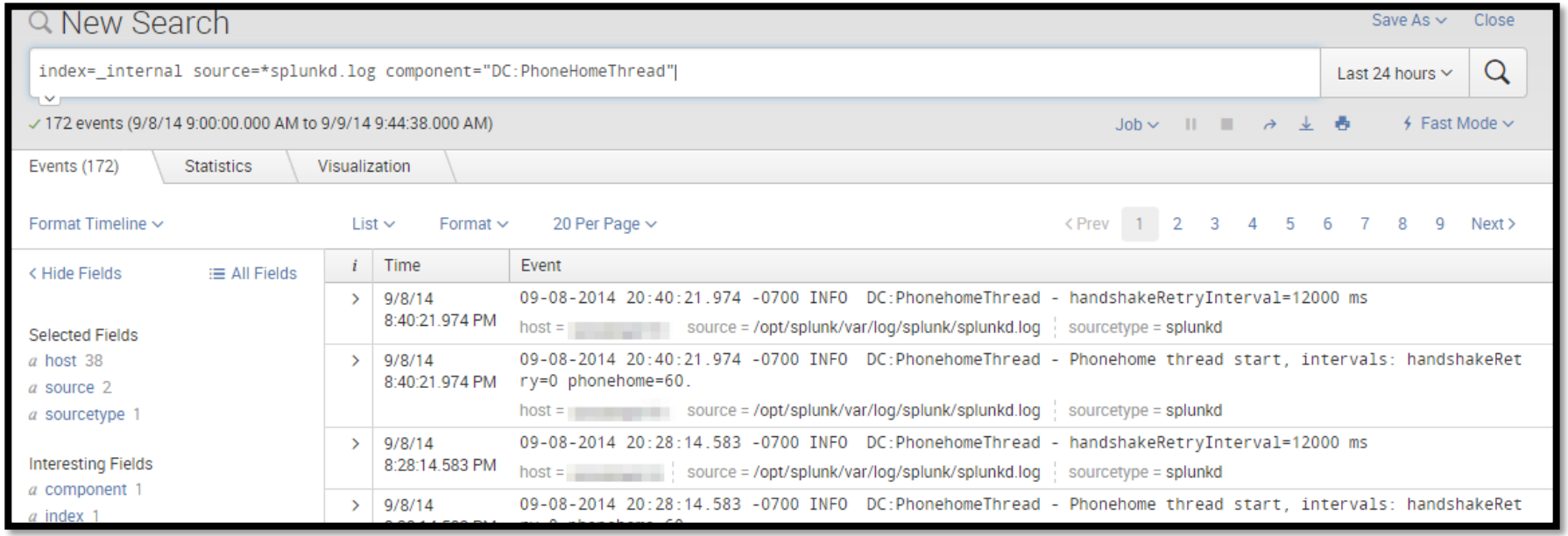
# Client: Refreshing a serverclass



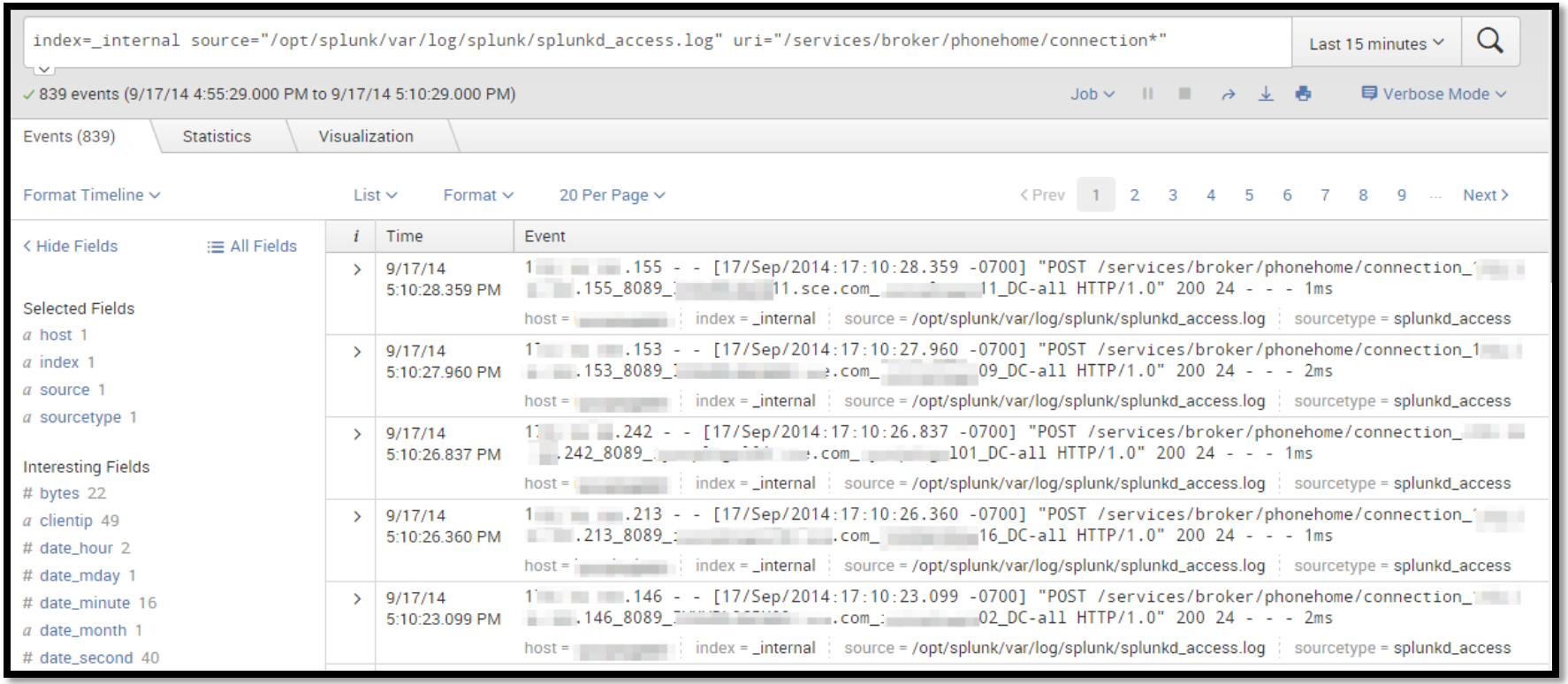
# Client: Downloading and installing apps



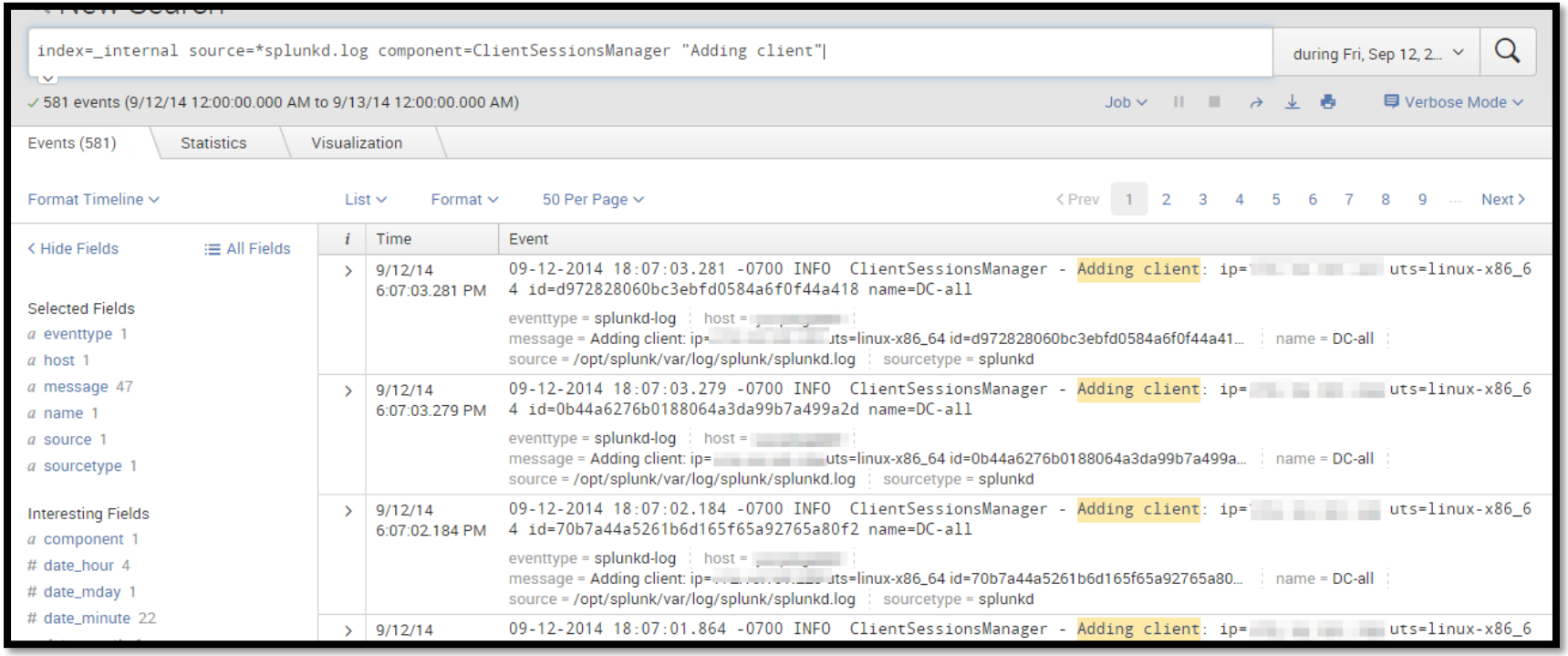
# Client: PhoneHome



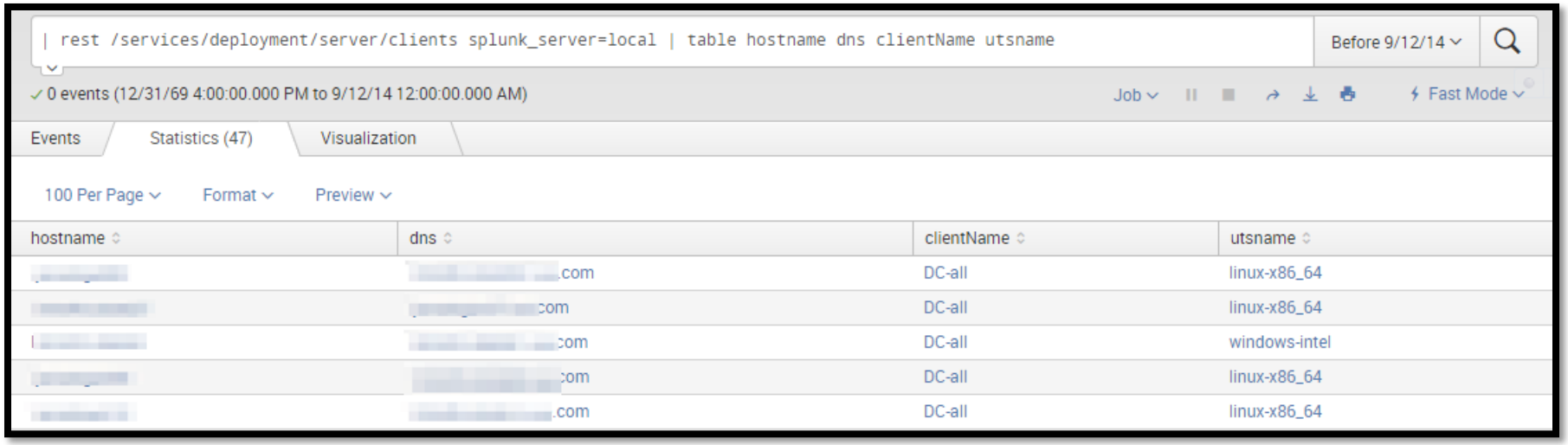
# Server: PhoneHome



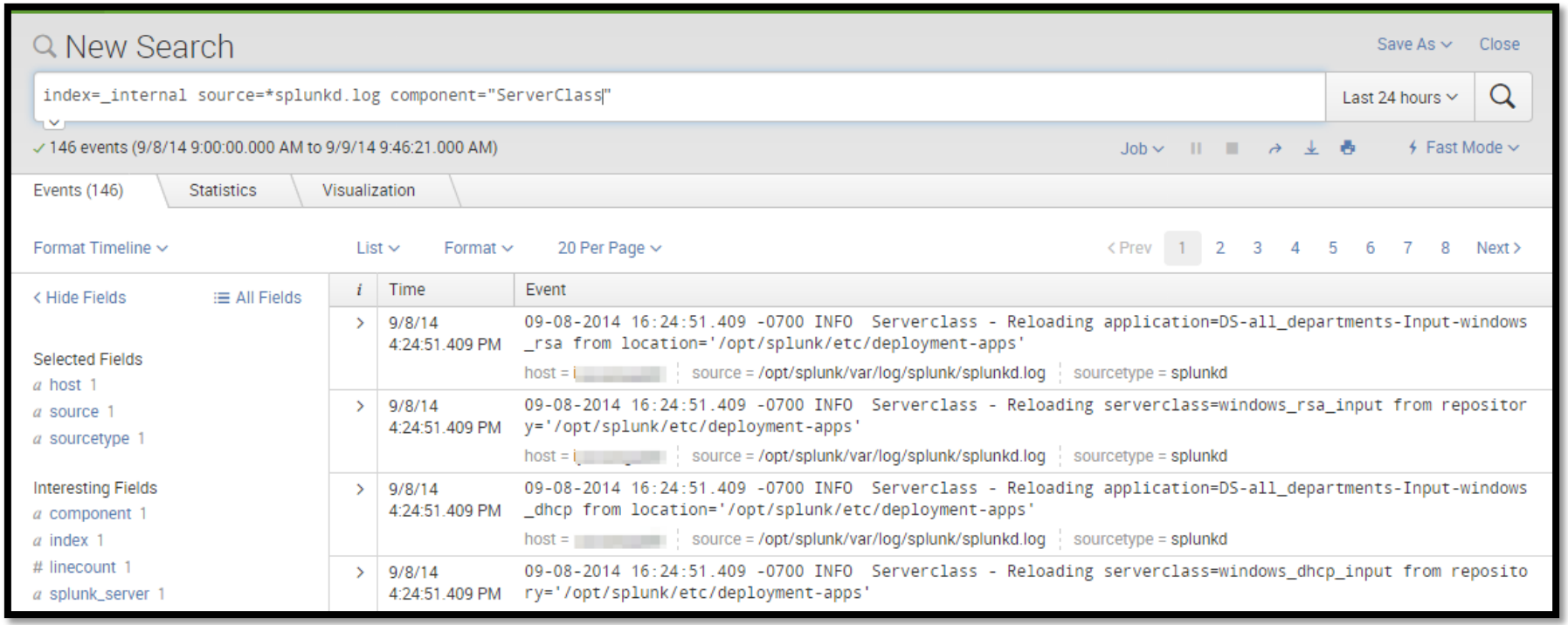
# Server: Recording client check-ins



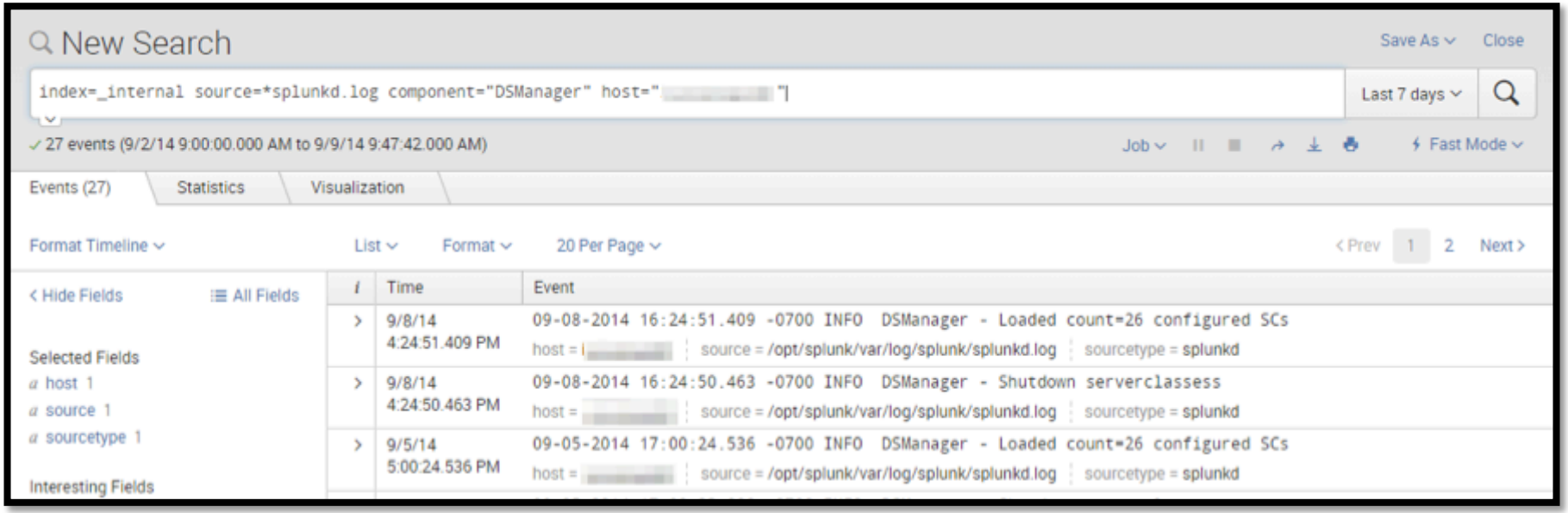
# Server: List the deployment clients



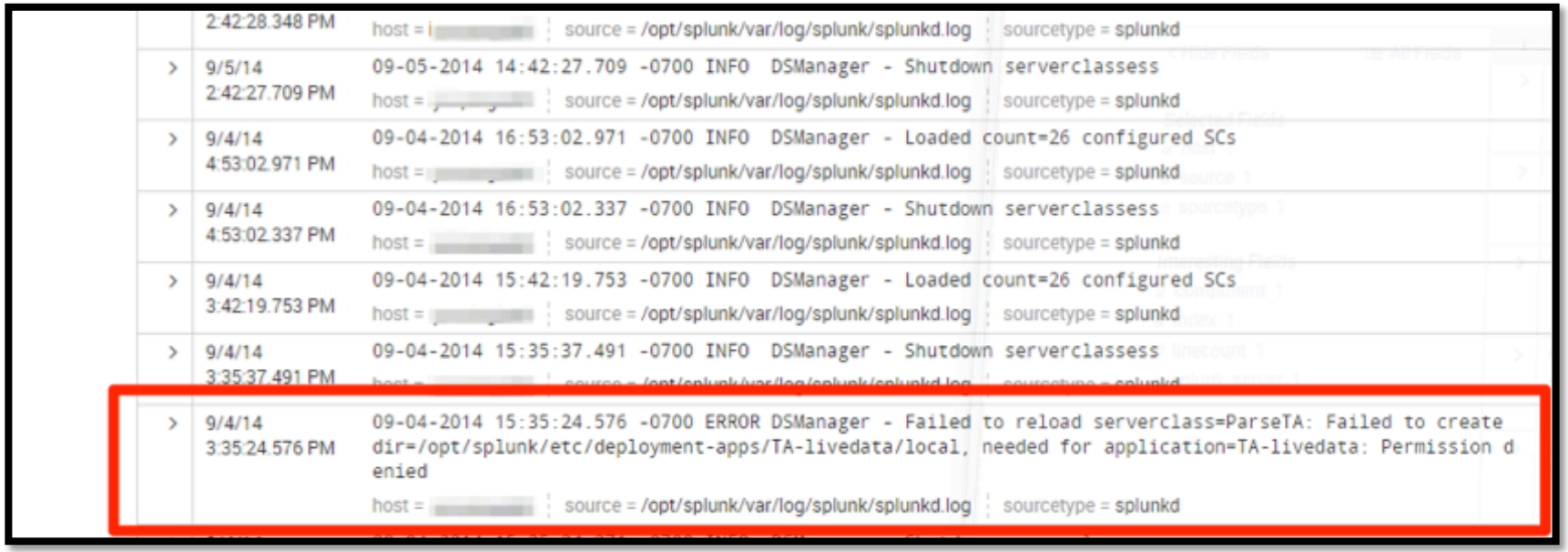
# Server: Loading classes and apps



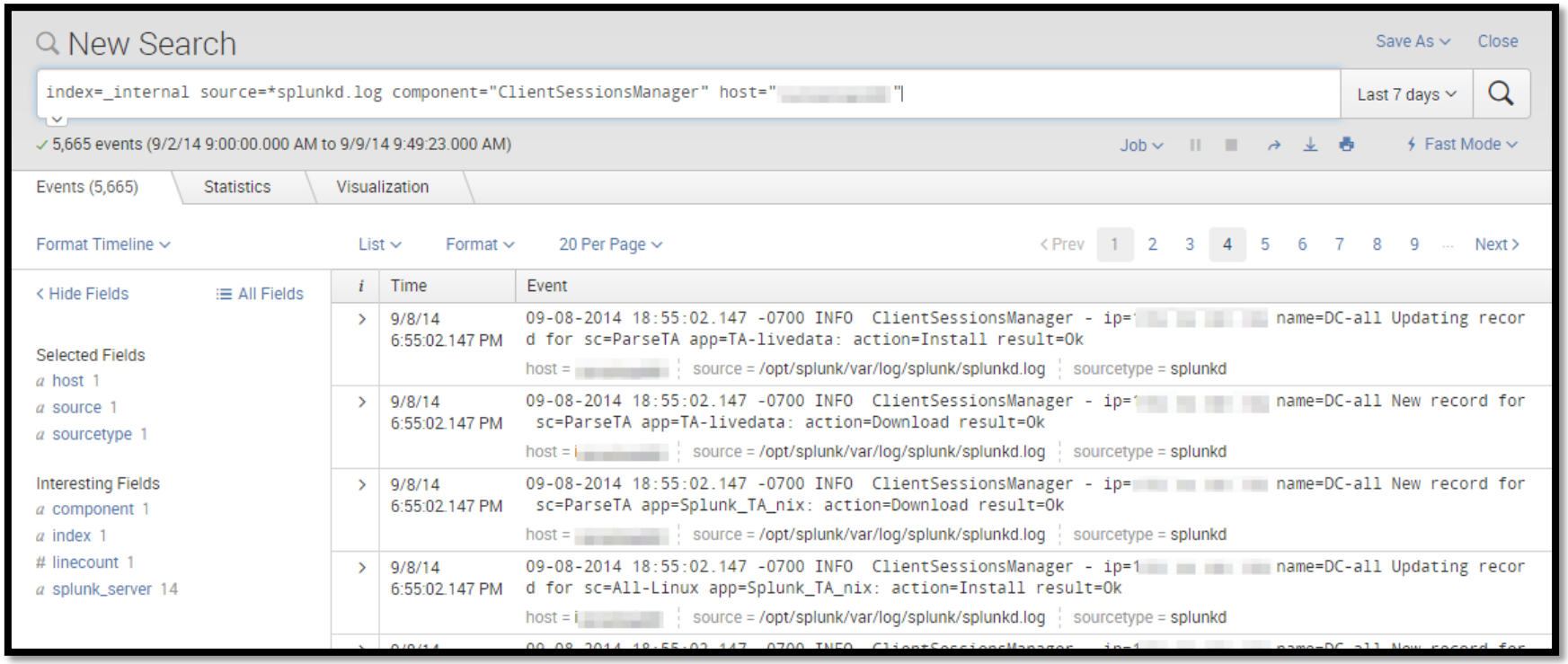
# Server: Reload



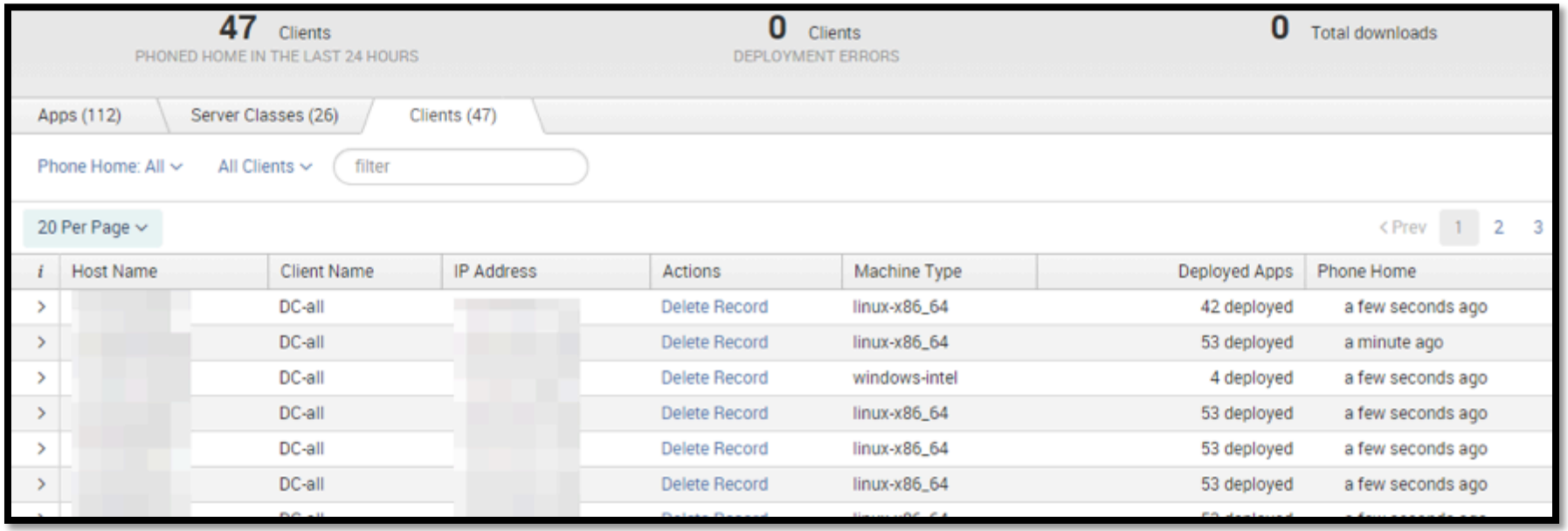
# Server: Reload (oops!)



# Server: Updating app installs

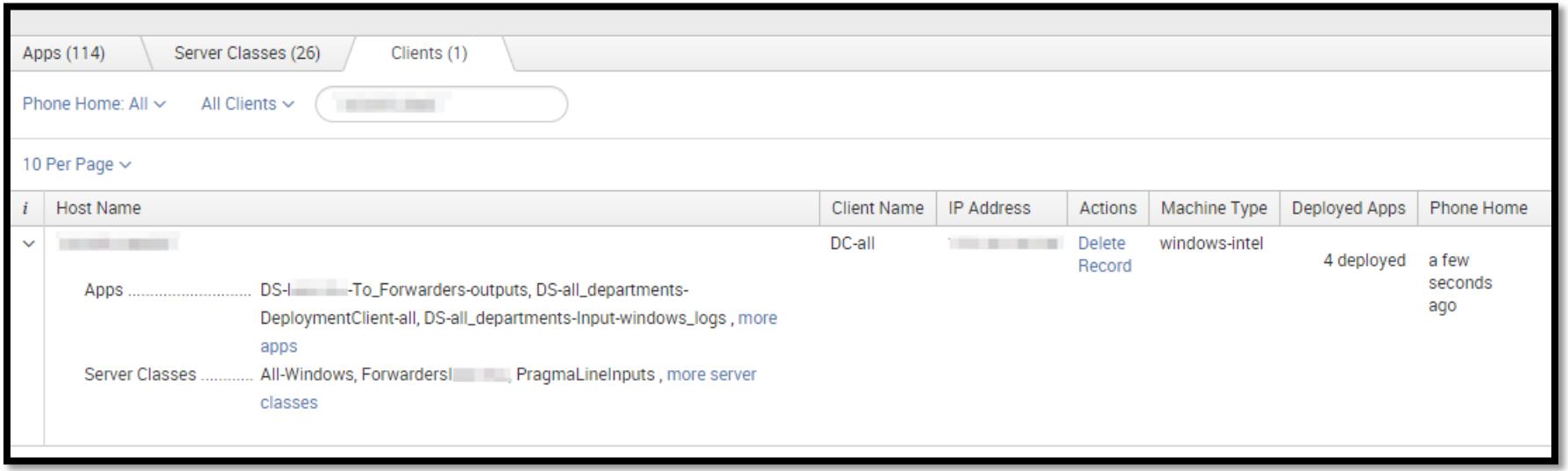


# Oh yeah, Forwarder Management




| i | Host Name | Client Name | IP Address | Actions | Machine Type | Deployed Apps | Phone Home |
|---|---|---|---|---|---|---|---|
| > | | DC-all | | Delete Record | linux-x86_64 | 42 deployed | a few seconds ago |
| > | | DC-all | | Delete Record | linux-x86_64 | 53 deployed | a minute ago |
| > | | DC-all | | Delete Record | windows-intel | 4 deployed | a few seconds ago |
| > | | DC-all | | Delete Record | linux-x86_64 | 53 deployed | a few seconds ago |
| > | | DC-all | | Delete Record | linux-x86_64 | 53 deployed | a few seconds ago |
| > | | DC-all | | Delete Record | linux-x86_64 | 53 deployed | a few seconds ago |

# Oh yeah, Forwarder Management



# Serverclass.xml

- Present on the clients
- Is a copy of the response from the deployment server to the deployment client
- Tells you which server classes the client thinks it belongs to, and which apps it thinks it should have
- But, it's all the way out on the endpoint
- If only we had a way to capture this data, and bring it to a central repository, perhaps index it so that we might be able to search it later ;-)


# Scaling Splunk Deployment Server

splunk>

# How much Deployment Server do I need?

- Not a lot of clients? Maybe a small VM
- Moar clients? MOAR SERVER!

# What if I have a lot of clients?

- Lots of clients = lots of check-ins
- Current maximum number of clients per Deployment server is:
- Windows: 500 – 2,000 (closer to the bottom one)
- Linux: 5,000 – 10,000
- (note that this is using reference hardware)
- By default, these clients check in every minute

# Change the default phoneHomeIntervalInSecs

- Found in deploymentclient.conf
- Defaults to 60 seconds
- How often are you changing those configs?
- Five minutes? Thirty minutes?
- Play the numbers game

# No, really, I mean ALOT of clients

- Currently no built-in solution
- May mean having multiple deployment servers

# Dedicated or Collocated?

- Keep in mind, there will be a lot of connections
- You don't want to run out of sockets
- What if you need to restart the deployment server?
- Remember, a deployment server can't be a client of itself
- Deployment server + license master works well
- If the server that the deployment server is on isn't a client of itself, you have to manage its configuration another way
- Can lead to configuration mismatches and inconsistency

# Load balancing?

- Does not work as expected
- Remember that hash? Yeah, that's the reason
- Not just the files and contents
- Includes modified time and other info
- If the hash doesn't match what the client currently has, it will grab a "new" version. This could mean a loop of restarts (fun!)

# FIN

- Some other talks to check out:
  - Avoid the SSLippery Slope of Default SSL - Duane Waddle and George Starcher
  - Using Lesser Known Commands in Splunk Search Processing Language (SPL) - Kyle Smith
  - Masters of IRC Community Panel
  - Building a Common Information Model (CIM) Compliant Technical Add-on (TA) – Brian Wooden and Jack Coates
  - Curating User Experience: Dashboarding Tips and Tricks – Sanford Owings
  - Getting The Most Out of Your Splunk License: Keeping the Junk Out of Splunk – David Paper
  - How Splunkd Works – Amrit Bath and Jag Karai


# THANK YOU

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