

# SDNの試験

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Janog37.5 Interim Meeting

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# 自己紹介

- 名前: 中嶋 大輔
- 所属: ジュニパーネットワークス
  - 主にCloud関係のSEやっています
- 趣味
  - 自転車
  - お酒

() OPENCONTRAIL



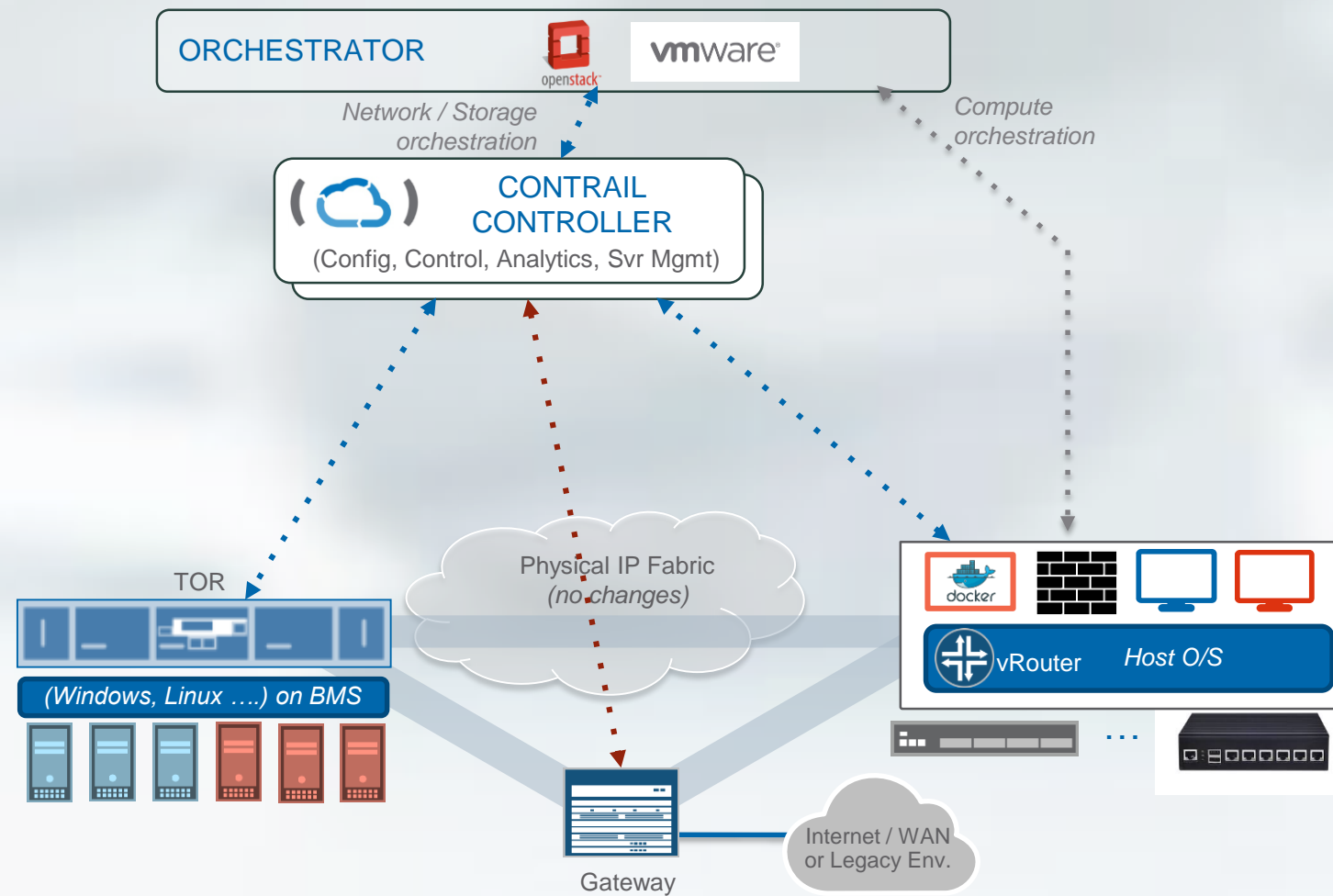
# 本日本話すること

- Contrailのテストについて
- ユーザーでのテストについて

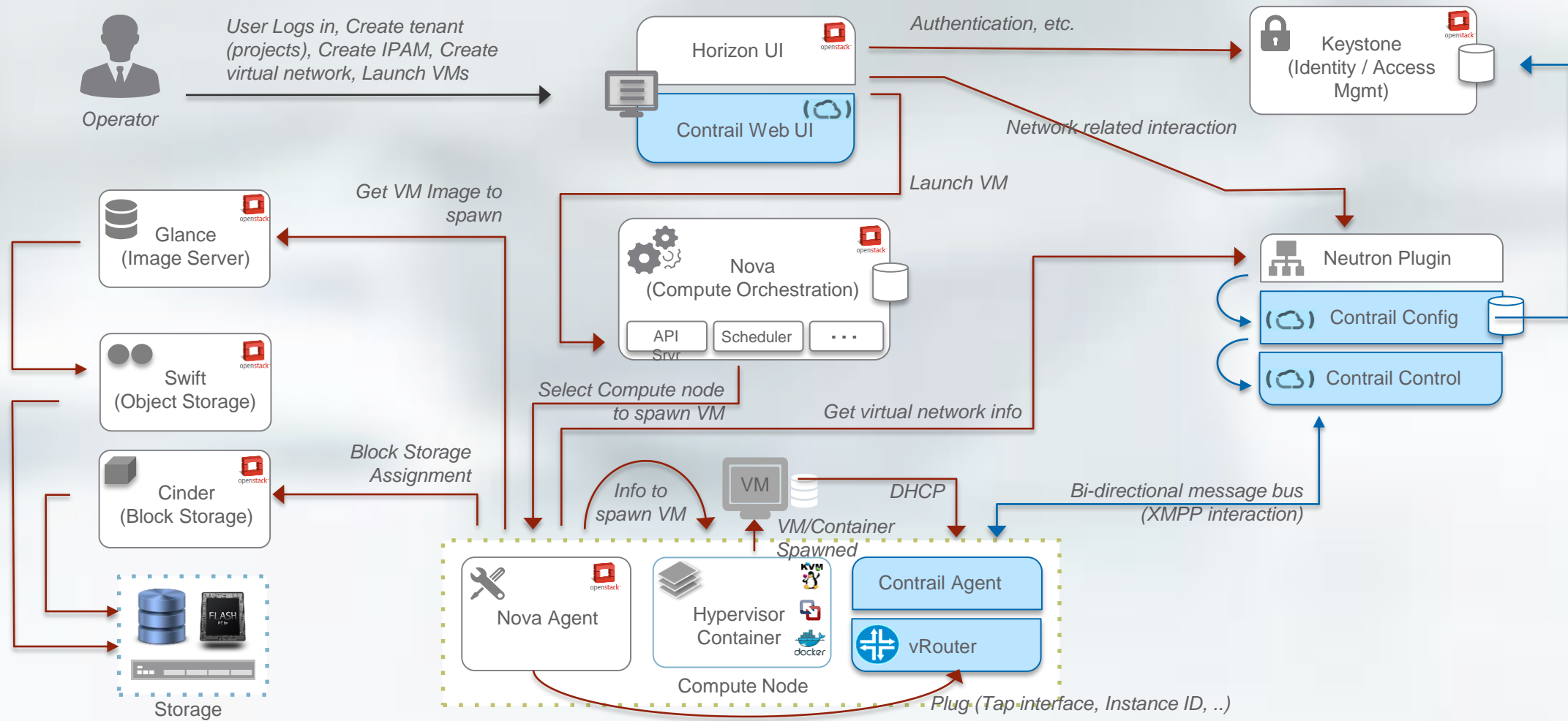
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# Contrail と 関連パーツ

# Contrail Networking System



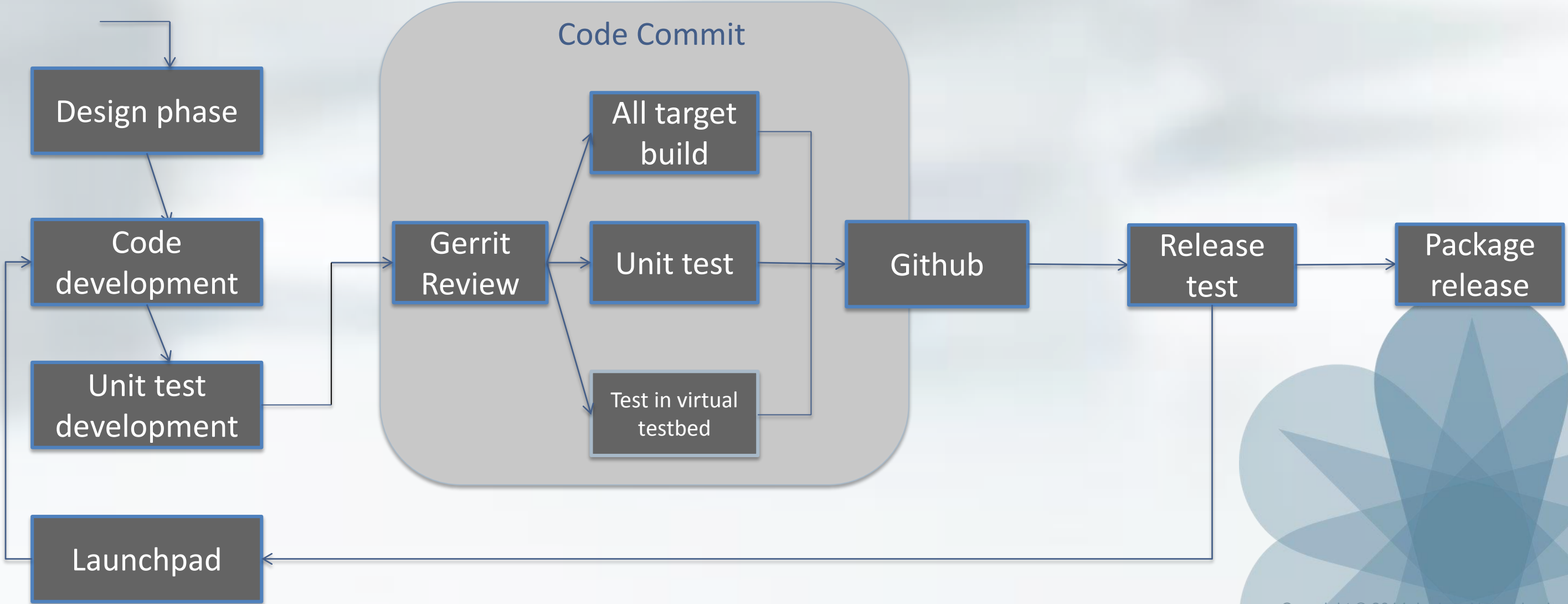
# Openstack & Contrail Components



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# Contrailのテスト方法

# Contrailのリリースサイクル





# テスト内容

- 健全性テスト
  - 複数のOS上での機能テスト
  - OpenStackやVMwareとの連携テスト など
    - <https://github.com/Juniper/contrail-test/blob/master/sanity-test-cases-details.txt>
- リグレッションテスト
  - 機能ごとに行うテスト。約一週間おこなう
- スケーリングテスト
  - VM, VN, ポリシー, セキュリティグループなどのスケーリングテスト
- パフォーマンステスト
  - TCP/UDPなどのトラフィックパフォーマンステスト

# テスト内容

## リリース試験

- ユーザーシナリオテスト
  - 自動化では難しいユーザーの使い方に応じたテスト
- 障害テスト
  - 各種障害試験
  - Contrailだけでなく、ゲートウェイルーターの障害試験なども含む
- スケーリングテスト

# Gerrit Code Review

Code Review

All
Documentation

status:open Search

Search for status:open

ID	Subject	Owner	Project
I11ff0dcf	Do not overwrite per-service configuration after receiving publish messages. Ini	Deepinder Setia	Juniper/contrail-controller
Ic3bd9d76	nova debs for liberty - changes in rules file	amudha ramachandran	Juniper/contrail-packaging
I1636cca2	Use 5-tuple to distribute flow setup across partitions	Praveen K V	Juniper/contrail-controller
I7afb827f	DiscoveryClient stops resubscribing even after ttl period.	Nipa Kumar	Juniper/contrail-controller
I4a3b29b4	Closes-Bug: #1540112 Fix graphs not loading on new version of Chrome (48)	Sagar Gala	Juniper/contrail-web-console
I8a82905f	Removing distribute from test-requirements, because distribute is deprecated in	Ignatious Johnson Christopher	Juniper/contrail-controller
Ie4c9cb99	Return RefsExistError when secrule already exists	Jean-Philippe Braun	Juniper/contrail-controller
Ibfdc5766	Closes-Bug: #1557755 Make changes to puppet modules to have explicit orderin	Abhay Joshi	Juniper/contrail-puppet
I6088c2c7	Fallback to MetaData IP if service IP is not confd	Prabhjot Singh Sethi	Juniper/contrail-controller
Id78ee59f	* Dont apply VRF translation rule if packet is getting DNATed VRF translation sh	Naveen N	Juniper/contrail-controller
I8a82905f	Removing distribute from test-requirements, because distribute is deprecated in	Ignatious Johnson Christopher	Juniper/contrail-controller
If65cc5e3	Closes-Bug: #1543916 - Changes to send a separate call for all node details page	Manoj	Juniper/contrail-web-console
I6fa23f8d	Do not allow updating in address on a port	Sachin Bansal	Juniper/contrail-controller

**Comments**
Expand Recent | Expand All | Collapse All

Zuul Patch Set 1: Starting check jobs. <a href="http://status.opencontrail.org/zuul/">http://status.opencontrail.org/zuul/</a>	6:12 AM
<b>opencontrail-admin</b> Patch Set 1: PASSED:Found_bug_id_in_commit_message.	6:12 AM
<b>opencontrail-admin</b> Patch Set 1: Started Jenkins job ci-contrail-controller-unittest-ubuntu14 ...	6:14 AM
<b>opencontrail-admin</b> Patch Set 1: Started Jenkins job ...	6:15 AM
<b>opencontrail-admin</b> Patch Set 1: Started Jenkins job ...	6:15 AM
<b>opencontrail-admin</b> Patch Set 1: Started Jenkins job ...	6:15 AM
<b>opencontrail-admin</b> Patch Set 1: Started Jenkins job ...	6:15 AM
Zuul Patch Set 1: Build succeeded. - noop noop : SUCCESS	6:16 AM
<b>opencontrail-admin</b> Patch Set 1: Completed Jenkins job ...	8:18 AM
<b>opencontrail-admin</b> Patch Set 1: Completed Jenkins job ...	8:31 AM
<b>opencontrail-admin</b> Patch Set 1: Completed Jenkins job ...	9:50 AM
<b>opencontrail-admin</b> Patch Set 1: Completed Jenkins job ...	11:05 AM
<b>opencontrail-admin</b> Patch Set 1: Started Jenkins job ...	11:06 AM
<b>opencontrail-admin</b> Patch Set 1: Started Jenkins job ...	11:41 AM
<b>opencontrail-admin</b> Patch Set 1: Completed Jenkins job ...	12:33 PM
<b>opencontrail-admin</b>	1:05 PM
Patch Set 1:	
Completed Jenkins job ci-contrail-controller-systest-ubuntu14-smlite with SUCCESS at 10.84.34.143 <a href="https://jenkins.opencontrail.org/job/ci-contrail-controller-systest-ubuntu14-smlite/2586/console">https://jenkins.opencontrail.org/job/ci-contrail-controller-systest-ubuntu14-smlite/2586/console</a>	

# Jenkins

The screenshot shows the Jenkins dashboard. On the left, there is a sidebar with navigation links: 開発者, ビルド履歴, 認証情報, ビルドキュー (with a minus sign), and ビルド実行状態 (with a minus sign). Under 'ビルド実行状態', there are two sections: 'master' with 1 待機中 and 2 待機中, and two slave nodes: 'ci-oc-slave-centos64-10-84-34-75 (オフライン)' and 'ci-oc-slave-centos64-10-84-34-75-66.129.239.15 (オフライン)'. The main area shows a table of jobs with columns for status (S, W), name, latest successful build, and latest failed build. The jobs listed are: ci-contrail-build-systest-centos64-havana, ci-contrail-build-systest-centos71-juno, ci-contrail-build-systest-centos71-kilo, ci-contrail-build-systest-redhat70-icehouse, ci-contrail-build-systest-redhat70-juno, ci-contrail-build-systest-redhat70-kilo, ci-contrail-build-systest-ubuntu12-icehouse, ci-contrail-build-systest-ubuntu14-havana, ci-contrail-build-systest-ubuntu14-icehouse, and ci-contrail-build-systest-ubuntu14-juno.

The screenshot shows the details of a failed build #4176. The build name is 'ビルド #4176 (2016/03/28 17:26:49)' and it was triggered by a change. The build log shows that the build failed due to a failure in the 'ci-contrail-controller-systest-ubuntu12-icehouse #4176' job. The log content is as follows:

```
<p>
  Triggered by change:
  <a href="https://review.opencontrail.org/18663">18663,1</a><br/>
  Branch: <b>R2.21.x</b><br/>
  Pipeline: <b>check</b>
</p><p>
  Other changes tested concurrently with this change:
  <ul><li><a href="https://review.opencontrail.org/18661">18661,2</a></li></ul>
</p>
<p>
  All builds for this change set:
  <ul><li>
    ci-contrail-controller-systest-centos71-juno: None
  </li><li>
    <a href="https://jenkins.opencontrail.org/job/ci-contrail-controller-systest-redhat70-icehouse/4188/">
      ci-contrail-controller-systest-redhat70-icehouse #4188</a>: SUCCESS
  </li><li>
    <a href="https://jenkins.opencontrail.org/job/ci-contrail-controller-systest-ubuntu12-icehouse/4176/">
      ci-contrail-controller-systest-ubuntu12-icehouse #4176</a>: FAILURE
  </li><li>
    <a href="https://jenkins.opencontrail.org/job/ci-contrail-controller-systest-ubuntu14-icehouse/4072/">
      ci-contrail-controller-systest-ubuntu14-icehouse #4072</a>: FAILURE
  </li><li>
    <a href="https://jenkins.opencontrail.org/job/ci-contrail-controller-systest-ubuntu14-juno/7302/">
      ci-contrail-controller-systest-ubuntu14-juno #7302</a>: FAILURE
  </li></ul>
</p>
```

<https://jenkins.opencontrail.org/>

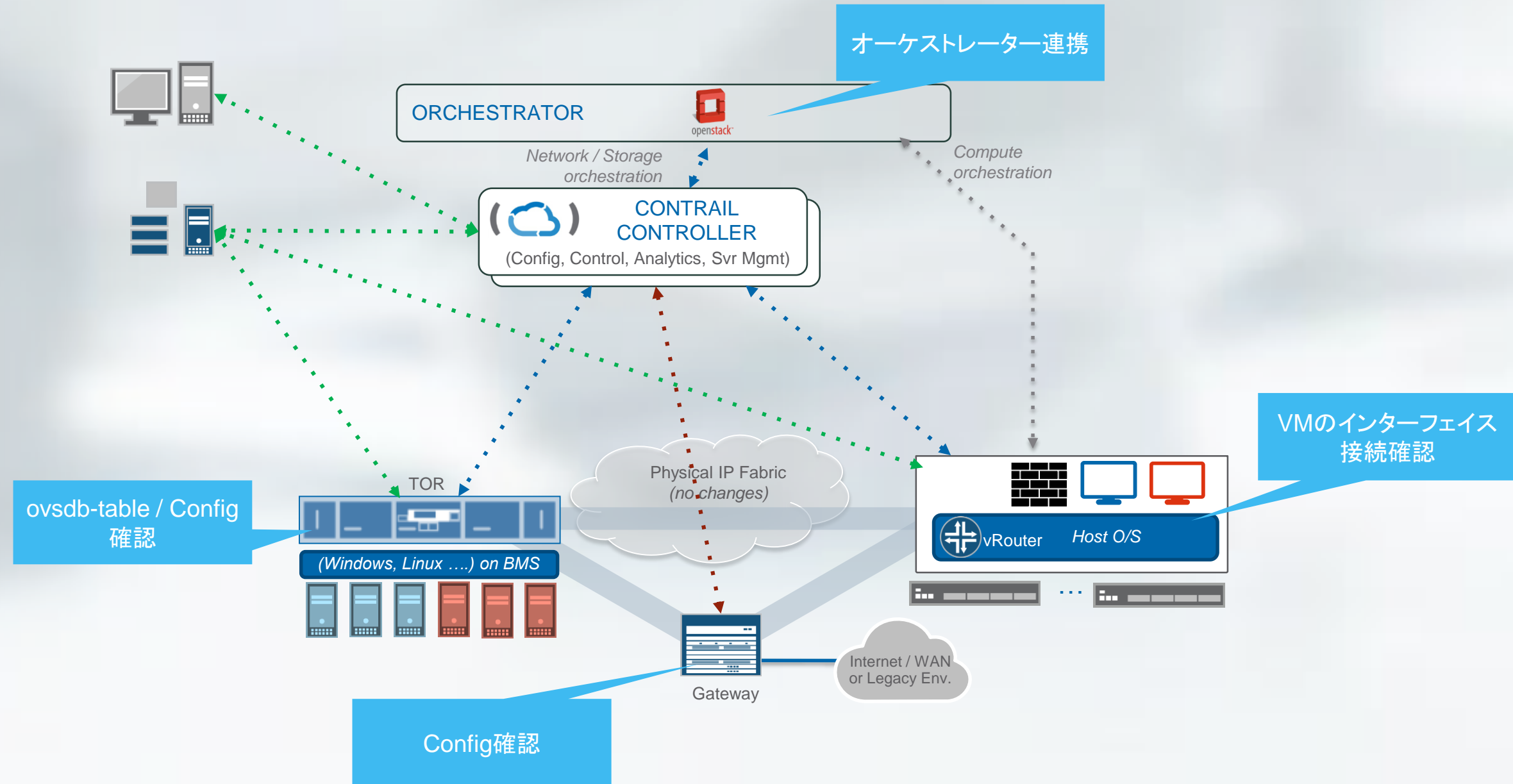


# ユーザーテスト

# たとえば・・・

- 機能試験
  - 実際に使用する機能が正常動作するか確認
- 結合試験
  - 監視サーバや課金システムなどとの連携確認
- シナリオ試験
  - エンドユーザーのユースケースを想定した試験
- スケール試験
  - 最大収容を想定した試験
- 運用試験
  - 障害時の動作確認やバックアップ・リストア、増設試験など・・・
  - ネットワークを制御しますが、サーバなので一般的なサーバ監視など必要です
  - Noisy Neighbor/DDoS試験など

# システム連携例



# コントローラとデータプレーンの整合性確認

## Controller側データ

OvsvdbVlanPortBindingResp

bindings					more
state	physical_port	physical_device	logical_switch	vlan	true
In sync(4)	ge-0/0/24	shinjuku	6bced479-785d-4687-8a06-4e4792a020fe	101	
In sync(4)	ge-0/0/24	shinjuku	d2570d7d-296b-432a-b597-ca78d31c1531	102	
In sync(4)	ge-0/0/24	shinjuku	450b231f-4ca5-428f-a23d-6d93323dc8d6	103	
In sync(4)	ge-0/0/24	shinjuku	e8a55483-520b-4909-8e5e-9cb2d4e5fd3a	104	
In sync(4)	ge-0/0/24	shinjuku	cd68577c-9686-4fc3-a977-b3b8e45fe5fe	105	
In sync(4)	ge-0/0/24	shinjuku	7dcd235f-1bdb-4640-8c1c-522a3c558ee5	106	
In sync(4)	ge-0/0/24	shinjuku	bc2c5de9-feaf-4f2d-9ab8-4e9c1a91fb7b	107	
In sync(4)	ge-0/0/24	shinjuku	75752a93-3ea9-484d-a945-bfde353c2198	108	
In sync(4)	ge-0/0/24	shinjuku	0362462a-b073-45f0-9d48-d6bbefd91840	109	
In sync(4)	ge-0/0/24	shinjuku	5629c333-09c9-4856-9e91-d7d6395d90ad	110	

## ToRSwitch側データ

```
sec_since_disconnect="2884", state=ACTIVE] "ssl:10.84.50.100:9999"
```

```
68c59-6e75-4da2-9a0e-435cdd48cbda, 0c0e1075-04c7-4009-a01c-ea4cfe962ee8, 15fb6b78-bff9-4048-a26d-51e788328b75, 16b1609a-ad43-4a7c-8ea4-5346b9f25108,
3c400de6ec38, 31deb7a8-0580-475e-b5a8-fe35bdad3621, 35380c66-7215-413b-a968-8746fa15c2ae, 42d10dea-9c77-44aa-b278-19115ad2e24f, 472aba6b-d199-426d-a19b-
485b-83a1-4f54db3dbca2, a281b38f-d162-4363-9938-4d27c925d59b, a5a60aba-fcd0-4738-a8dd-b7f367aa3a74, a82d0537-d042-4648-af07-495b4e911816, ac63be9a-a9fd-432b-8aba-82716166512d, acb9d467-4098-4f8a-8180-0710ae67d2c9, ad086fca-9565-4650-8447-8da5ed00f0c9,
b0e7a061-358f-4c37-a97a-107e65716ace, b2b7c97a-9d94-4c25-94b0-9950f4997fbc, b3c5f183-85a4-4c92-88a1-5ffe6c1cb238, b72b2382-cddf-4ecf-a137-847111442351, ba93f06d-7064-4683-9207-72fe6d726046, c562ffcd-bd2c-474e-9457-e62124bfe69c, c5a7ae38-cdc7-42b4-965d-
817980986060, c8da5b6f-8eed-4a35-8741-3e1446a44b24, c9402ad8-5754-4fa5-a99a-2007181509f7, d15f78fb-2595-4a7a-9fc4-8b1d8fd764d0, d5775ae4-bc79-4d43-b9bd-1687ed12c60d, d68a5551-842f-4f26-b16f-f5470c4a6074, d88b8bf6-5469-42d5-a930-b36bb33944e7, db9e1d0b-8f32-
46bc-934f-efd359168d36, ef7ad7b8-d7e0-4d0c-b15d-a44977db0d34, f29de94d-9b0d-425f-b5be-dd7547419078, fade3962-f1ad-4d52-a337-b00575db0ab0, fe10259b-552c-4e7f-9be6-cb1be10b547f] []
["10.84.51.71"] [62df2a39-074c-4ce8-9881-3a3ccfd828ea]
```

```
Tunnel table
uuid          bfd_config_local          bfd_config_remote  bfd_params  bfd_status          local          remote
-----
62df2a39-074c-4ce8-9881-3a3ccfd828ea [bfd_dst_ip="169.254.1.0", bfd_dst_mac="dc:38:e1:58:a6:c0"] {} [enabled="true", state=down] 90da833d-541c-4b60-b108-6881c1d76509 b626c8be-2438-4be6-adc3-63316691c2ec

Ucast_Macs_Local table
MAC          _uuid          ipaddr  locator          logical_switch
-----
"22:22:22:00:00:01" 080a4f40-df38-4c90-8316-e49181894234 "0.0.0.0" 90da833d-541c-4b60-b108-6881c1d76509 7f9a6c82-d042-4d7a-bc31-afdd24256d9f

Ucast_Macs_Remote table
MAC _uuid ipaddr locator logical_switch
-----
```



# 整合性チェックツール

```
----- Mcast_Macs_Remote Table -----
Sync all data
----- Ucast_Macs_Local Table -----
Sync all data
----- Mcast_Macs_Local Table -----
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e67b58bf-39b1-4436-9170-0906ff883507', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e69b3e5b-074a-4802-bea2-3a6235b00f65', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e6a1c707-fdf6-4e70-845c-b856daff451e', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e6abd870-bf2e-48c4-8b42-5d0405500e56', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e6b9efcc-54f3-4a1a-89a4-f6a63a93728d', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e6befa40-2d07-4719-ba5a-ab2ddc2939a4', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e6c129e2-88bd-49d1-8cc0-292497026d37', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e6e41ff7-d123-4e31-8e57-6cbac9da94a4', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e706cd40-83da-471a-9dc4-331b65543126', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e736ea31-7173-46d5-9279-e096381bcf0d', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e7c32f56-2724-4e85-9854-9a3fa3c86f8d', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e7c627c5-b316-45b9-abec-5c33220bed62', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e7cf17b7-f3cd-4e9a-a5ae-f550ae3c69ab', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e7d373df-cc03-47f9-9dd6-4ab8a37f67c7', u'10.84.51.73']]
[{'flag': 'NotInOVSDB'}, [u'In sync(4)', u'ff:ff:ff:ff:ff:ff', u'e7e7ea4a-7950-425d-8223-16c2120f1ea8', u'10.84.51.73']]
----- Physical_Switch Table -----
Sync all data
----- Logical_Switch Table -----
Sync all data
----- Ucast_Macs_Remote Table -----
Sync all data
----- Physical_Port Table -----
Sync all data
```

# それでもやっぱり

- パケットを運ぶのはデータプレーンです。
  - データベースが一致していても、FIBのバグで通信できなかったり・・・
- ソフトウェアルータやToR-Switchのデータプレーンの確認方法はSDNの世界でも重要です。

# 参考資料

- Contrail
  - Contrailの基本
    - <http://www.slideshare.net/DaisukeNakajima/opencontrail-for-2014-kansaikyoto>
  - ContrailとNFV
    - <http://www.slideshare.net/DaisukeNakajima/opencontrailnfv>
  - OpenContrailポータル
    - <http://www.opencontrail.org/>
    - Sandboxあります
  - 整合性チェックツール
    - <http://komadori-blog.blogspot.jp/2016/02/contrail-tsntor-switchovsdb-server.html>

