Systems Management with a Voice User Interface using Amazon Alexa

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Amazon Web Services
What to expect

- Voice UI Introduction
- Amazon Alexa Skill
- Amazon EC2 Systems Manager
- An example Build-a-skill
Voice User Interface (VUI)

- Interact using voice
- Natural Language Understanding (NLU)
- Perform actions
- Communicate results
Alexa Skills Architecture

User audio streamed → Alexa Service

Audio response → User intents and arguments

User intents and arguments → Text response

Text response → Skill Service

Skill Service

Application metadata, intents, utterances & endpoint → Skill Interface

Skill Interface

#VelocityConf
Alexa Skill Components

Alexa Skill

Skill Interface
- Utterances
- Slots
- Intents

Skill Service
- AWS Lambda
Alexa Skill Interface - Intents

```
{
    "intents": [
        {
            "intent": "RunCommandIntent",
            "slots": [
                {
                    "name": "Command",
                    "type": "LIST_OF_COMMANDS"
                },
                {
                    "name": "Target",
                    "type": "LIST_OF_TARGETS"
                }
            ]
        },
        {
            "intent": "AMAZON.HelpIntent"
        },
        {
            "intent": "AMAZON.CancelIntent"
        }
    ]
}
```
Alexa Skill Interface - Utterances

RunCommandIntent {Command} on {Target} instances

RunCommandIntent {Command} on my {Target} instances

RunCommandIntent {Command} on all {Target} instances

GetInventoryIntent how many instances have {Filter} installed
Amazon EC2 Systems Manager

https://aws.amazon.com/ec2/systems-manager/
Amazon EC2 Systems Manager - Configuration Compliance

- Scans your fleet of managed instances for patch compliance and configuration inconsistencies.
  - Patch Compliance
  - Association Compliance
Amazon EC2 Systems Manager - Patch Compliance

- Create a Patch Baseline
- Add a Patch Group
- Create a Maintenance Window

Compliance Summary

- 2 Instances are up to date
- 2 Instances are missing updates
- 0 Instances are in error State

- ListComplianceSummaries API
Amazon EC2 Systems Manager - ListComplianceSummaries

- **Request**

```json
{
    "Filters": [
        {
            "Key": "string",
            "Type": "string",
            "Values": [ "string" ]
        }
    ],
    "MaxResults": number,
    "NextToken": "string"
}
```

- **Response**

```json
{
    "ComplianceSummaryItems": [
        {
            "ComplianceType": "string",
            "CompliantSummary": {
                "CompliantCount": number,
                "SeveritySummary": {
                    "CriticalCount": number,
                    "HighCount": number,
                    ...
                }
            },
            "NonCompliantSummary": {
                "NonCompliantCount": number,
                "SeveritySummary": {
                    "CriticalCount": number,
                    "HighCount": number,
                    ...
                }
            }
        }
    ],
    "NextToken": "string"
}
```
Intent & Utterances for ListComplianceSummaries

```
{
  "intents":[
    {
      "intent": "PatchComplianceStatusIntent"
    },
    {
      "intent": "AMAZON.HelpIntent"
    },
    {
      "intent": "AMAZON.CancelIntent"
    }
  ]
}
```

PatchComplianceStatusIntent Is my fleet compliant?

PatchComplianceStatusIntent Are all my instances patched?

PatchComplianceStatusIntent Am I missing any updates?

…
AWS Lambda (Node JS)

- Intent Handler

```javascript
 SystemsManager.prototype.intentHandlers = {
   "PatchComplianceStatusIntent": function (intent, session, response) {
     getPatchComplianceStatus(intent, session, response);
   },

   "AMAZON.HelpIntent": function (intent, session, response) {
     helpTheUser(intent, session, response);
   }
};
```
Intent Handler

```javascript
function getPatchComplianceStatus(intent, session, response) {
  makeListComplianceSummaryRequest(function runListResponseCallback(err, callResponse) {
    var speechOutput;
    if (err) {
      speechOutput = "Sorry, unable to make request. Please try again later";
    } else {
      nonCompliantCount = callResponse.ComplianceSummaryItems[0].NonCompliantSummary.NonCompliantCount;
      if (nonCompliantCount === 0) {
        speechOutput = "All your instance are Patch compliant.";
      } else {
        speechOutput = "You have " + nonCompliantCount + " instances that are not Patch compliant."
      }
    }
    response.tellWithCard(speechOutput, "SystemsManager", speechOutput);
  });
}
```

```javascript
function makeListComplianceSummaryRequest(runListResponseCallback) {
  var ssm = new aws.SSM();
  var params = {
    Filters: [
      {
        Key: 'ComplianceType',
        Values: ['Patch'],
        Type: 'Equal'
      }
    ]
  };
  ssm.makeListComplianceSummaries(params, function(err, data) {
    if (err) {
      console.log(err, err.stack); // an error occurred
      runListResponseCallback(err);
    } else {
      console.log(data); // successful response
      runListResponseCallback(null, data);
    }
  });
}
```
Final Thoughts

- VUI or GUI
- Use Amazon Alexa Beta Skills
- Use Amazon Alexa Notifications
- Use Multi Factor Authentication
Resources

- Amazon EC2 Systems Manager - https://aws.amazon.com/ec2/systems-manager/
- Amazon Alexa Developer Resources - https://developer.amazon.com/alexa
- AWS Lambda - https://aws.amazon.com/lambda/
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