Remote Attestation in the Cloud

With Veraison

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Feb 02, 2025

Safe harbor statement

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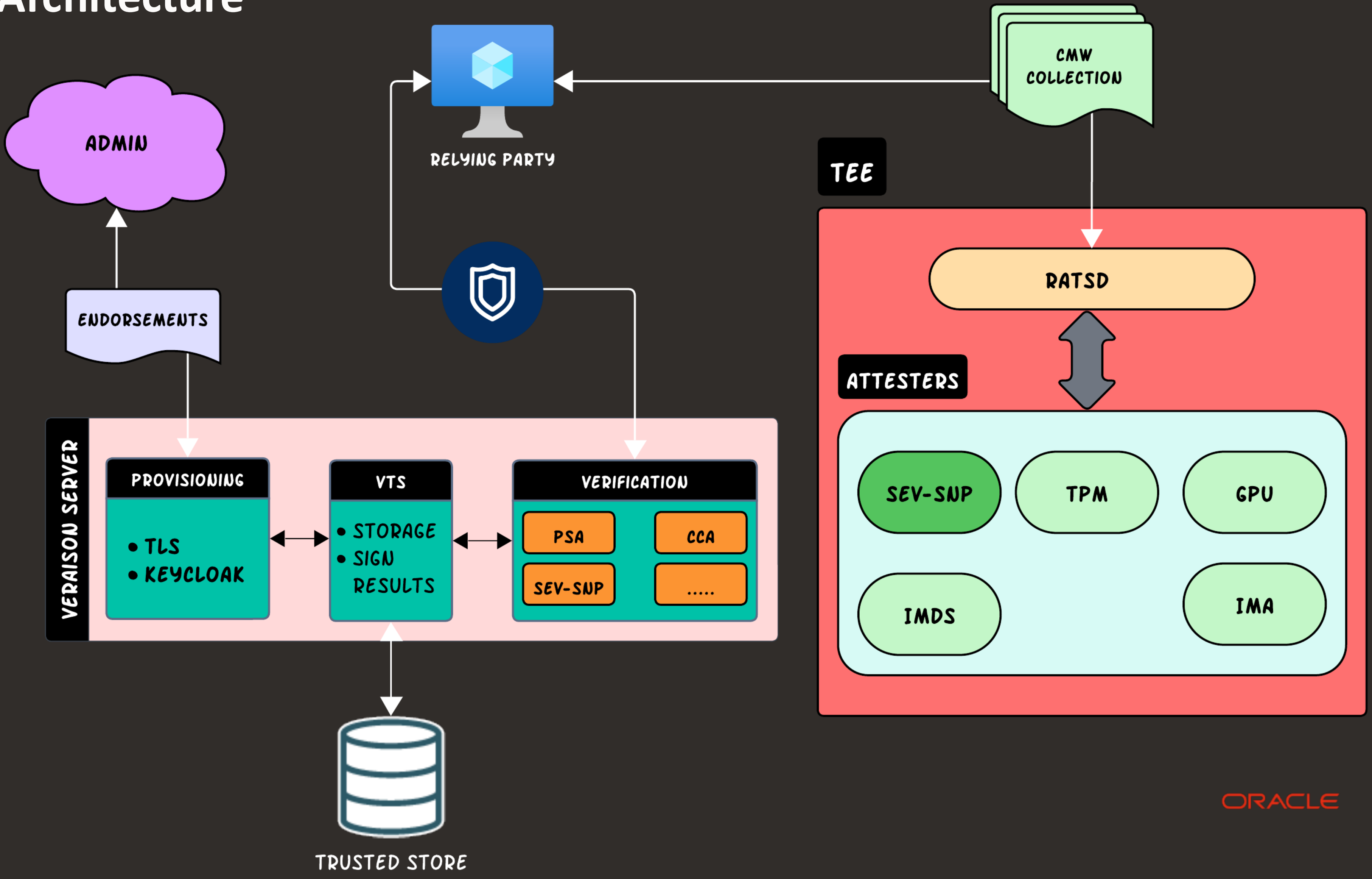
Agenda

- Veraison
- Architecture
- Endorsements
- Evidence format
- Verification
- Result format
- Oracle contribution
- Demo
- Upcoming features
- Acknowledgements

Veraison

- IETF RATS compliance
- Software components
  - Server
  - RATSd, go-gen-ref, cocli, evcli
- Support for token formats and attestation protocols
  - CoRIM (Concise Reference Integrity Manifest)
  - EAT (Entity Attestation Token) / CMW (Conceptual Message Wrapper)
- Scalable
- Interoperable
- Open-source

System Architecture



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SEV-SNP Endorsements

- Trust Anchors
  - Root Keys (eg. ARK & ASK)
- CoRIM Reference Values
- SEV-SNP profile
  - IETF draft
  - SEV-SNP Attestation Report
  - Mkeys
- `go-gen-ref` generates reference values
  - Compute launch measurement

```
{
  "lang": "en-GB",
  "tag-identity": {
    "id": "da3c7818-55ef-4aaa-a465-1f59d2872b1e"
  },
  "triples": {
    "reference-values": [
      {
        "environment": {
          "class": {
            "id": {
              "type": "oid",
              "value": "1.3.6.1.4.1.3704.3.1"
            }
          },
          "instance": {
            "type": "bytes",
            "value":
"wqZSi3Nk4H6fXGU6s6oNvXOE+agN/eVMxkPdu4nYk2Ql/4oyVoym7XcQINw5wzzP+ztD
ysDFAaAJPK1gEt/T7Q=="
          }
        },
```

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```
 "measurements":  [
          {
            "key": {
              "type": "uint",
              "value": 641
            },
            "value": {
              "digests": [
                "sha-
384;C8yFu/d5q8TGw/OyKF6JFxTqmRnGT1QhkuWbnKSefWGRIqnylmWiQ52i4IVkHN1+"
              ]
            }
          },
          {
            "key": {
              "type": "uint",
              "value": 3330
            },
            "value": {
              "version": {
                "value": "1.55.40”,
                "scheme": "semver"
              }
            }
          }
        ]
      }
    ]
  }
}
```

SEV-SNP Evidence

- Evidence formats
- CMW collection
- Registered TSM report media-type with IANA: “application/vnd.veraison.tsm-report+cbor”
- RATSd: https://github.com/veraison/ratsd

CMW collection

```
{
    "__cmwc_t":
”application/vnd.oracle.VMStandardE5Flex",
    "sevsnp": [
        {
            "type": "application/vnd.veraison.tsm-
report+cbor",
            "value": "<< tsm-report >>"
        }
    ],
    "tpm": [
        {
            "type": "application/vnd.tcg.tpm",
            "value": "<< TPMS_ATTEST >>"
        }
    ]
}
```

IANA recognizes "application/vnd.veraison.configfs-tsm+json”.

Yet to register ”application/vnd.oracle.VMStandardE5Flex” & "application/vnd.tcg.tpm

SEV-SNP Evidence

- Evidence formats
- CMW collection
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tsm-report

```
tsm-report = {
  ? auxblob: binary-string
  outblob: binary-string
  provider: tstr
  ? service-report
}

service-report = ((
  manifestblob: binary-string
  service_provider: tstr
) // service_provider: tstr)

binary-string = base64url-string .feature "json" / bstr
.feature "cbor"

base64url-string = tstr .b64u bstr
```

Attestation Result

- EAR (EAT Attestation Result)
- Trustworthiness vector
- Description of various aspects of security

Result

```
"ear.appraisal-policy-id": "policy:SEVSNP",
     "ear.status": "affirming",
     "ear.trustworthiness-vector": {
       "configuration": 0,
       "executables": 0,
       "file-system": 0,
       "hardware": 2,
       "instance-identity": 0,
       "runtime-opaque": 2,
       "sourced-data": 0,
       "storage-opaque": 0
     }
```

Oracle’s contribution

- SEV-SNP plugin for the server: `https://github.com/jraman567/services`
- go-gen-ref to build reference values: `https://github.com/jraman567/go-gen-ref`
- RATSd tool to compose evidence, WIP: `https://github.com/veraison/ratsd`
- Oracle Linux deployment of Veraison
- Active community collaboration

Demo

Upcoming features

- Support for more attestation schemes
- RATSd
- Endorsement and Reference Value distribution
- Authorization

Acknowledgement

- Dionna Amalie Glaze (dionnaglaze@google.com)
- Sergei Trofimov (Sergei.Trofimov@arm.com)
- Thomas Fossati (thomas.fossati@linaro.org)
- Yogesh Deshpande (Yogesh.Deshpande@arm.com)

Thank you