T1195.501 SIM credential theft

Description: An adversary may get access to several SIM credentials either by physical access to SIM card inventory or by injecting malware on SIM vendor server.

Unauthorized actors use various means to intercept/steal SIM data in transit from SIM card vendors towards the HSM or the UDR/UDM in the operator's network and by gaining physical access to the SIM card inventory in order to obtain customer credentials.

Labelling:

* Sub-technique: N/A
* Applicable Tactics: credential-access

Metadata:

* Architecture segment: UE
* Platforms: 5G
* Access type required: physical or malware insertion
* Data Sources:
* Theoretical/ Proof of concept/Observed: Observed

Procedure Examples:

|  |  |
| --- | --- |
| **Name** | **Description** |
| Specific example if known | If there is a documented instance of this technique occurring in earlier generation or a notional example |
| Infiltrate SIM vendor’s network. | An adversary can implant malware on a SIM vendor server or gain physical access to their SIM cards and thus obtain SIM credentials. |

Mitigations

|  |  |
| --- | --- |
| **ID** | **Description** |
| If known | Short description of potential mitigations. |
| M1017 | Personnel security: Train personnel in SIM card OEMs to be wary of social engineering and other attempts of unauthorized parties to gain access to any relevant resource, and to report suspicious activities |
| M1030 | Physical and cyber security of IT systems, servers. |
| M1022 | Restrict access to files exchanged between SIM vendor and MNO |
| M1041 | Protect the files where SIM data is stored by encryption |
| FGM1557 | Protect the files where SIM data is stored by integrity protection |

Pre-Conditions

|  |  |
| --- | --- |
| **Name** | **Description** |
| If known | Short description of conditions that must be present for technique to be used. |
| Implant malware or physical access | Adversary needs to either implant malware in SIM vendor’s server or have physical access to the SIM card inventory |

Critical Assets

|  |  |
| --- | --- |
| **Name** | **Description** |
| If known | Short description of the assets that adversary wants to target or that are at risk such as data (system/user, access token, crypto key etc.), capability, service. |
| Privacy of subscriber data | Adversary is after getting the keys to decrypt cellular communications for those sets of SIMs whose credentials it captured. |

Detection

|  |  |
| --- | --- |
| **ID** | **Description** |
| If known | Short description of possible detection techniques such as logs or sensors. |
|  |  |

Post-Conditions

|  |  |
| --- | --- |
| **Name** | **Description** |
| If known | Short description of potential capabilities achieved by the technique (e.g. escape from container gives control of the host) |
| Subscriber data leak | Subscriber’s sensitive signaling and user plane data are exposed to the adversary. |

References

|  |  |
| --- | --- |
| **Name** | **URL** |
| Daily Mail.com, news article 20 Feb 2015, "US and UK spies hacked SIM card manufacturer to steal codes that allowed them to eavesdrop on mobile phones worldwide, according to bombshell documents leaked by Ed Snowden". | https://www.dailymail.co.uk/news/article-2961314/US-UK-hacked-SIM-card-manufacturer-steal-codes-allowed-eavesdrop-mobile-phones-worldwide-according-bombshell-documents-leaked-Ed-Snowden.html |
| GSMA FS.28 “Security Guidelines for Exchange of UICC Credentials”, Version 1.0, November 2020. | https://www.gsma.com/security/resources/fs-28-security-guidelines-for-exchange-of-uicc-credentials/ |
| Gemalto article on SIM credential threat: “GEMALTO PRESENTS THE FINDINGS OF ITS INVESTIGATIONS INTO THE ALLEGED HACKING OF SIM CARD ENCRYPTION KEYS BY BRITAIN'S GOVERNMENT COMMUNICATIONS HEADQUARTERS (GCHQ) AND THE U.S. NATIONAL SECURITY AGENCY (NSA)” | https://www.thalesgroup.com/en/markets/digital-identity-and-security/press-release/gemalto-presents-the-findings-of-its-investigations-into-the-alleged-hacking-of-sim-card-encryption-keys |
| BBC article: “US and UK accused of hacking Sim card firm to steal codes“ | https://www.bbc.com/news/technology-31545050 |
| Securitytoday.com article: “U.S. and Britain Work Together to Pull off SIM Card Heist” | https://securitytoday.com/articles/2015/02/20/us-and-britain-work-together-to-pull-off-sim-card-heist.aspx?admgarea=ht.government |

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*Background info*:

The SIM credentials enable actors to decrypt the voice, text and data communications of targeted mobile users in a passive way in order to evade detection.

Mitigations that were written but removed since they didn’t need a FiGHT -specific mitigation

* Secure SIM data by strong encryption
* Protect the files where data is stored by encryption and integrity protection
* Securely transfer those files between SIM vendor and MNO by physical or digital transmission

[2]