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THREATGEN® AUTOTABLETOP

IVSS Calculations

CLINT BODUNGEN

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IVSS Scoring Formulas

The following formulas are used to calculate the IVSS score.

Base Severity Score

The Base Severity Score subvalues are defined as follows:

r_c – report confidence value (0.25 if Unconfirmed, 0.5 if Uncorroborated, 1 if Confirmed or Not defined)

b_c – consequence value (0.25 if Temporary Denial, 0.5 if Data Modification, 0.75 if Sustained Denial Or Loss, 1 if Control)

r_l – remediation level value (0 if Official Fix, 0.75 if Workaround, 0.9 if Temporary Fix, 1 if Unavailable or Not Defined)

The Base Severity Score value is a weighted average of these subvalues with weights of 1, 3 and 1 multiplied by 10.

$$B_S = \frac{r_c + 3b_c + r_l}{5} \times 10$$

Base Exploitability Score

The Base Exploitability Score subvalues are defined as follows:

e_c – exploit difficulty value (0.2 if High, 0.5 if Moderate, 1 if Low)

e_x – exploit maturity value (0.5 if Unproved That Exploit Exists, 0.75 if Proof Of Concept Code, 1 if Functional Exploit Exists or Not Defined)

a_u – privilege level required value (0.2 if Admin/Root, 0.56 if User, 1 if None)

u_i – user interaction required value (0.3 if Yes, 1 if No)

The Base Exploitability Score is an average of these subvalues multiplied by 10.

$$B_{EX} = \frac{e_c + e_x + a_u + u_i}{4} \times 10$$

Base Accessibility Score

The Base Accessibility Score subvalue is defined as follows:

$\mathbf{a_V}$ – user interaction required value (0.1 if Local Host (Physical), 0.5 if Local Network, 1 if Adjacent Or Remote Network or Undefined)

The Base Accessibility Score is this subvalue multiplied by 10.

$$A_V = 10a_v$$

Total Base Score

The Total Base Score subvalues are defined as follows:

B_S – base severity score value (see section 1)

B_{EX} – base exploitability score value (see section 2)

A_V – base accessibility score value (see section 3)

The Total Base Score value is a weighted average of these subvalues with weights of 1, 1 and 2.

$$T_{BS} = \frac{B_S + B_{EX} + 2A_V}{4}$$

Local Accessibility

The Base Exploitability subvalues are defined as follows:

l_a – asset access value (0.25 if Local Host (Physical), 0.5 if Local Network, 1 if Adjacent or Remote Network)

c_p – network segmentation level value (0.2 if ISA/IEC 62443 Compliant, 0.75 if DMZ + Partial ICS Segmentation, 0.85 if DMZ Only, 1 if None (Flat Network))

The Local Accessibility value is a product of these subvalues multiplied by 10.

$$L_A = 10 l_a c_p$$

Consequences

The Consequences subvalues are defined as follows:

v_i – process visibility consequence value (0 if None, 0.5 if Partial, 1 if Complete)

m_i – process monitoring consequence value (0 if None, 0.5 if Partial, 1 if Complete)

c_i – process control consequence value (0 if None, 0.5 if Partial, 1 if Complete)

The Consequences value is a weighted average of these subvalues with weights of 1, 1 and 3 multiplied by 10.

$$C = \frac{v_i + m_i + 3c_i}{5} \times 10$$

Industrial / Kinetic Impact

The Consequences Score subvalues are defined as follows:

c_d – financial loss impact value (0 if None, 0.35 if Low ($100K - $500K), 0.5 if Low-medium ($500K - $1M), 0.8 if Medium-high ($1M - $5M), 1 if High ($5M+) or Not Defined)

p_i – system production impact value (0 if None, 0.4 if Low, 0.7 if Medium, 1 if High or Not Defined)

r_i – system reliability impact value (0 if None, 0.33 if Low, 0.66 if Medium, 1 if High or Not Defined)

s_i – system safety impact value (0 if None, 0.5 if Low, 0.8 if Medium, 1 if High or Not Defined)

The Industrial / Kinetic Impact value is a weighted average of **p_i**, **r_i** and **s_i** with weights of 5, 1 and 20, multiplied by **c_d** and 10.

$$I_{IK} = \frac{5p_i + r_i + 20s_i}{26} \times 10c_d$$

Adjusted Accessibility

The Adjusted Accessibility subvalue is defined as follows:

$\mathbf{L_A}$ – local accessibility value (see section 5)

The Adjusted Accessibility value is equal to the local accessibility subvalue.

$$A_A = L_A$$

Adjusted Impact/Criticality

The Adjusted Impact/Criticality subvalues are defined as follows:

C – consequences value (see section 6)

I_{IK} – industrial / kinetic impact value (see section 7)

The Total Base Score value is a weighted average of these subvalues with weights of 1 and 2.

$$A_{IC} = \frac{C + 2I_{IK}}{3}$$

Final Score

The Final Score is the IVSS score, of which subvalues are defined as follows:

T_{BS} – total base score value (see section 4)

A_A – adjusted accessibility value (see section 8)

A_{IC} – adjusted impact/criticality value (see section 9)

The Final Score value is a weighted average of these subvalues with weights of 1, 5 and 10.

$$S_{IVSS} = \frac{T_{BS} + 5A_A + 10A_{IC}}{16}$$