To create a security case for the ACAS Xu system based on the given security case pattern and following the provided predicate rules, the instantiated assurance case using Goal Structuring Notation (GSN) is listed below. I have replaced placeholders and instantiated context based on the domain information provided for the ACAS Xu system.

Hierarchical Tree Structure:

- \*\*Goal (G0, ACAS Xu satisfies security requirements)\*\*

- \*\*Context (C0, Description of ACAS Xu)\*\*

- \*\*Context (C1, Security requirements (SRs) are requirements about protecting ACAS Xu from malicious entities)\*\*

- \*\*Justification (J0, The argumentation is based on satisfaction of SRs)\*\*

- \*\*Assumption (A0, System SRS are complete, adequate, and consistent)\*\*

- \*\*Strategy (S0, Argue through asset protection and secure development requirements)\*\*

- \*\*SupportedBy\*\*

- \*\*Goal (G1, ACAS Xu satisfies the asset protection requirements)\*\*

- \*\*Assumption (A1, Asset inventory is established)\*\*

- \*\*Strategy (S1, Argue through the different stages of the system development life cycle)\*\*

- \*\*SupportedBy\*\*

- \*\*Goal (G3, Asset protection requirements are met during the architecture design phase)\*\*

- \*\*Context (C2, Description of the ACAS Xu architecture)\*\*

- \*\*Strategy (S2, Argue through deriving security threats from SRs)\*\*

- \*\*SupportedBy\*\*

- \*\*Goal (G5, ACAS Xu architecture is protected against identified security threats (STs))\*\*

- \*\*Assumption (A2, All relevant threats have been identified)\*\*

- \*\*Strategy (S3, Argue over each security threat)\*\*

- \*\*SupportedBy\*\*

- \*\*Goal (G0.1, ACAS Xu architecture is protected against ST1 Tampering)\*\*

- \*\*Goal (G0.2, ACAS Xu architecture is protected against ST2 Spoofing)\*\*

- \*\*Goal (G0.3, ACAS Xu architecture is protected against ST3 Elevation of Privileges)\*\*

- \*(These goals are undeveloped, indicating that each security threat against the ACAS Xu system will need to be protected and substantiated with further details).\*

- \*\*Goal (G6, ACAS Xu architecture is validated)\*\*

- \*\*Context (C3, Description of ACAS Xu architecture model)\*\*

- \*\*Assumption (A3, ACAS Xu architecture model is well defined in formal method)\*\*

- \*(This goal is undeveloped, indicating that the process of validation is not yet detailed).\*

- \*\*(Undeveloped) Goal (G4, Asset protection requirements are met during other phases)\*\*

- \*\*(Undeveloped and Uninstantiated) Goal (G2, ACAS Xu satisfies secure development requirements)\*\*

This security case structure outlines the argumentation flow from the system's top-level security requirements down to specific goals addressing asset protection and security threat mitigation. The placeholders have been replaced with ACAS Xu-specific information, and the system is presented alongside its architecture details and stages of response to security threats. Additional development is indicated for goals and strategies that require further instantiation and development.